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THE ASTROPHYSICAL JOURNAL

AN INTERNATIONAL REVIEW OF SPECTROSCOPY AND ASTRONOMICAL PHYSICS

Edited by

GEORGE E. HALE
Mount Wilson Observatory of the Carnegie Institution of Washington

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AN INTERNATIONAL REVIEW OF SPECTROSCOPY AND ASTRONOMICAL PHYSICS

VOLUME LXIV JULY 1926 NUMBER 1

RADIAL VELOCITIES OF 368 HELIUM STARS

By EDWIN B. FROST, STORRS B. BARRETT, and OTTO STRUVE

ABSTRACT

Radial velocities of 368 stars of classes B and O were measured on 2431 plates taken with the Bruce spectrograph of the Yerkes Observatory during the years 1901 to 1925. For nine-tenths of these a single prism was used giving a scale of 30 A per mm for the central ray at λ 4500. Comparison spectra of titanium and iron were used. *Forty-three per cent* of these stars have been found to be *spectroscopic binaries* at Yerkes Observatory or elsewhere.

The wave-lengths adopted for the stellar lines of the different elements are listed in Table I. Table II contains the *average radial velocities* from all lines used; also the velocities derived from the *calcium line* K and sometimes H, and other data. The results for separate plates are given in Table III.

The *probable error* for the average radial velocity is ±3.5 km/sec.; for a single spectrogram, ±9.0 km/sec.

Systematic errors have been investigated. An effect of coma in one-prism plates, due to the camera lens used until 1923, is believed to have been eliminated by corrections applied. This effect was absent from plates taken with three prisms, and from all plates obtained with the new Ross camera lens. Our velocities differ by about +1 km from those of the Lick Observatory.

From 350 stars grouped into 37 separate areas the *solar motion* was determined as follows: apex at $\alpha = 283°.8$, $\delta = +11°.7$; $V = 17.2$ km/sec. The K-term is +5.6 km/sec. The average residual velocity of these stars is 10.0 km/sec.

The regular work was begun with the Bruce spectrograph in the autumn of 1901. A description of the instrument, with illustrations, and of the methods adopted for the measurement of the plates and determination of the radial velocities was given by Frost in this *Journal*, **15**, 1–27, 1902.

A number of stars showing the helium lines, now designated as of class B, were at once placed upon the program in order to find whether the radial velocities of these stars could be determined with satisfactory precision. The results obtained for 20 of these stars

were published in 1903.[1] In that paper a full account was given of other details that had been developed in our experience with stars of this type. Some 8 of these stars had been included in the pioneer list of 51 stars measured by Vogel and Scheiner and published in 1892.[2] The helium lines, however, had not been identified as such at that time, their wave-lengths were not known, and they could not be used for measurements of radial velocity. The radial velocities of the stars had to be inferred from the displacements of the broad hydrogen lines.

THE SPECTROGRAPH

It soon became evident that the dispersion of three prisms was too high for stars of this class having the more diffuse lines. Alterations were therefore made in the instrument in 1903, so that one prism could be used, when desired, instead of three, the optical parts being unchanged otherwise. After the autumn of 1903, the lower dispersion was generally employed for all stars of class B. This decreased the scale to one-third of its former value, or to 30 A per mm for λ 4500 (the ray passing centrally through the optical system), but several important lines were thus brought into the measurable range of spectrum and the diffuse lines were narrowed, resulting in a general increase in accuracy. Of the 2431 spectrograms discussed in this paper, 2185 were taken with this dispersion of one prism. The necessary adaptations were also made so that two prisms could be employed for spectra for which that degree of dispersion was most suitable (20 A per mm for λ 4500). Of the spectrograms here utilized, only 16 were taken with this dispersion, and 230 with the original arrangement of three prisms.

On one-prism plates having the correct exposure and in the best focus, measurements have been made from λ 3900 to λ 5020. With three-prism plates, measurements were usually limited to the region from about λ 4330 to λ 4715.

Our prisms of Jena glass No. O 102, with an angle of 63° 34′, were used for all but a very few plates taken with a single Mantois re-

[1] Edwin B. Frost and Walter S. Adams, *Publications of the Yerkes Observatory*, **2**, 145, 1903.

[2] *Publicationen des Astrophysikalischen Observatoriums zu Potsdam*, **7**, 1892–1895.

annealed prism of angle 66°. The quadruple Isokumatic collimator designed by Hastings has an aperture of 51 mm and a focal length of 958 mm. Some changes were made in the triple camera lens, designated as B, such as the removal of cement with refiguring of the surfaces, and the substitution of other lenses of similar design, but always of closely the same focal length, about 607 mm, and apertures 76 or 57 mm.

In 1922 a quadruple lens of aperture 57 mm and focal length 599 mm was designed by Dr. F. E. Ross and constructed by Mr. J. B. McDowell. Since May 18, 1923, it has been used for all spectrograms taken with one prism, and these are designated as IR on our records. This lens extends the range of good definition to λ 3800 in the violet and to λ 5020 in the green part of the spectrum, while giving for the central region at λ 4500 a definition equal to that of the B lenses.

For stars with diffuse lines, the width of the slit has commonly been from 0.035 to 0.050 mm.

As comparison spectrum, we have employed that from the spark passing between terminals of titanium and of iron. For plates taken with one prism, the spectra of both of these elements were impressed on the plate at the beginning and end of the exposure, capacity and self-induction being used in the secondary circuit.

THE OBSERVATIONS

For several reasons the progress has been slow in completing the observations of the stars of class B brighter than 5.5. It has not been generally possible to assign to the spectrograph more than one-third of the nocturnal hours of the 40-inch refractor. The program of the spectrograph has also included during this time the observation of some 500 stars of class A of magnitude 5.5 and brighter. A list of visual binary systems with well-established orbits has also been under observation during this time, and we have attempted to observe systematically with high dispersion the radial velocities of the list of about a dozen standard velocity stars which were agreed upon for co-operative investigation by several other observatories, beginning in 1902.

It was the original plan that we should secure three spectrograms of each star of the helium type that was to be included in our pro-

gram, but so large a proportion of these were found to have variable radial velocities or to be highly suspicious in this respect, that we early decided to obtain at least five spectrograms, if possible. On the average, there are 6.6 spectrograms for each of the stars included here. Among the stars of this class 83 spectroscopic binaries have been announced from this Observatory, and for many of these a very large number of spectrograms has been required. Orbits have been determined here for 12 of these binaries. Thus far, 160 of the 368 stars, or 43 per cent, have been found to be variable in radial velocity, or to be spectroscopic binaries. We believe that we are justified in inferring that as high a proportion as 2 out of 3 stars of class B are spectroscopic binaries. Many must escape detection because of the necessarily large errors of measurement on stars having poor spectral lines; such lines would also mask the variation of binaries greatly inclined to the line of sight. Furthermore, the accidental distribution of spectrograms at any one observatory has often been such as not to reveal the variation in velocity of stars having considerable range; and the interval of time has been too short for bringing out the changes in binaries having long periods.

With the dispersion of three prisms the average exposure for stars of class B of magnitude 4.0 was 100 minutes. For the one-prism plates the exposure times for magnitudes 4.0 and 5.0 were respectively 30 and 60 minutes. Plates of various makers have been used at times, but our main reliance has been on Seed 27 and Seed 30, which were uniformly excellent. They have lately been replaced by the Eastman 40 and Speedway, which maintain the same high quality.

In the observation at the telescope and the measurement of the plates, several others have participated in addition to the authors of this paper. They are all named on page 29, but especial mention should be made of those who have contributed the most in this way, namely, Walter S. Adams and Oliver J. Lee.

MEASURES AND REDUCTIONS

The measurements have all been made on the simple type of comparator, constructed according to our design by William Gaertner & Company, at the time these observations began.

Spectrograms made with a dispersion of three or of two prisms have been reduced by a separate interpolation formula of the Hartmann-Cornu type, as described in the paper on the first 20 stars investigated. This was also done for spectrograms with a dispersion of one prism, until about 1909. At that time, it was decided that the economy in time of reduction justified the use of a less rigorous method. Hence Mr. Lee was requested to prepare tables according to the short method proposed by F. Schlesinger.[1] These tables have been used since that date, with some modifications and corrections. They necessarily involve some systematic errors, as we were then uncertain as to some of the identifications of the stellar lines and as to the most probable wave-lengths of all of them. When the Ross camera lens came into regular service in 1923, a new table for the short method was computed by Struve, with the inclusion of all of the former lines and a few additional ones. These tables have been used in the reduction of the greater part of the one-prism plates.

The reductions to the sun, computed in the usual manner, were readily checked by the graphical device constructed by Professor Van Biesbroeck for this purpose.

THE WAVE-LENGTHS

For the wave-lengths of the stellar lines, changes have been made to correspond with the progress in laboratory determinations. We have finally corrected all the measures to what seemed to be the best laboratory values available in 1925. This system is essentially identical with the one used at the Dominion Astrophysical Observatory at Victoria.[2] Table I contains the wave-lengths of the more important stellar lines. In addition to these, chiefly in the later spectral subdivisions, several enhanced lines of iron and of titanium were occasionally measured as direct displacements from the lines of the comparison spectrum. The stellar wave-lengths of these lines were assumed to be the same as those of the comparison lines. The differences between the I.A. and Rowland's system were taken from Hartmann's table.[3] The values of the wave-lengths of the helium

[1] *Publications of the Allegheny Observatory*, 1, 9, 1907.

[2] *Publications of the Dominion Astrophysical Observatory*, 2, 301, 1924.

[3] *Abhandlungen der Kgl. Gesellschaft der Wissenschaften zu Göttingen*, neue Folge, 10, No. 2, p. 74, 1916, Table VI.

lines finally used in our reductions have been those determined by Paul W. Merrill at the Bureau of Standards with the interferometer, referred to the standard cadmium line. The faint components of some of the helium lines that are double, like λ 4472, were not blended in Merrill's wave-lengths in proportion to the apparent intensity in the laboratory.

TABLE I

STELLAR WAVE-LENGTHS USED IN B-TYPE STARS

El.	λ(I.A.)	λ(R.)	El.	λ(I.A.)	λ(R.)	El.	λ(I.A.)	λ(R.)
Ca+	3933.667	.809	*C*	4267.160	.315	*Fe*	4549.474	.642
He	3964.727	.869	*O*	4317.160	.317	*Si*	4552.611	.780
Ca+	3968.476	.618	*O*	4319.650	.808	*Si*	4567.824	.994
H	3970.075	.217	*He+*	4338.690	.849	*Si*	4574.737	.907
He	4009.267	.412	*H*	4340.467	.626	*O*	4590.983	.153
He	4026.189	.335	*O*	4345.570	.729	*O*	4596.189	.361
O	4069.790	.940	*O*	4347.429	.588	*N*	4630.558	.730
O	4072.160	.310	*O*	4349.435	.595	*N+*	4634.165	.337
O	4075.870	.020	*O*	4351.275	.435	*O*	4638.865	.037
Sr	4077.735	.885	*Mg*	4351.923	.083	*OII*	4641.827	.999
SiIV	4088.863	.014	*O*	4366.906	.067	*OII*	4649.150	.322
N+	4097.330	.481	*He*	4387.928	.089	*C++*	4650.750	.922
H	4101.738	.890	*O*	4414.890	.052	*O*	4661.650	.823
SiIV	4116.104	.256	*O*	4416.970	.133	*O*	4676.246	.420
He	4120.812	.965	*He*	4437.549	.712	*He*	4685.740	.916
Si	4128.053	.207	*N-O*	4447.045	.205	*He*	4713.143	.326
Si	4130.884	.039	*He*	4471.477	.635	*H*	4861.326	.502
He	4143.759	.917	*Mg*	4481.230	.390	*Neb*	4958.910	.084
S?	4253.824	.980	*He+*	4541.610	.778	*Neb*	5006.840	.011

Rowland's values of the wave-lengths for the solar spectrum were used for the comparison lines. According to unpublished investigations by S. Albrecht, the errors introduced, by using these and not the most accurate laboratory values, do not exceed 0.1 km/sec. in the final velocities.

SYSTEMATIC ERRORS

A very important systematic error, affecting all our plates taken with the Hastings triple camera lens in combination with one prism, is due to the effect of coma.[1] To eliminate this error, corrections for every measured line were computed from the equation

$$9R+5\Delta R-429=0,$$

[1] O. Struve, *Popular Astronomy*, **32**, 624, 1924.

where R is the reading on the measuring machine expressed in millimeters and ΔR is the systematic difference expressed in ten-thousandths of a millimeter or in units of 0.1μ. These corrections are shown graphically in Figure 1. The abscissas are angstrom units and the ordinates are kilometers per second.

The three-prism plates, as well as those one-prism plates which were taken with the Ross lens, are practically free from coma. The

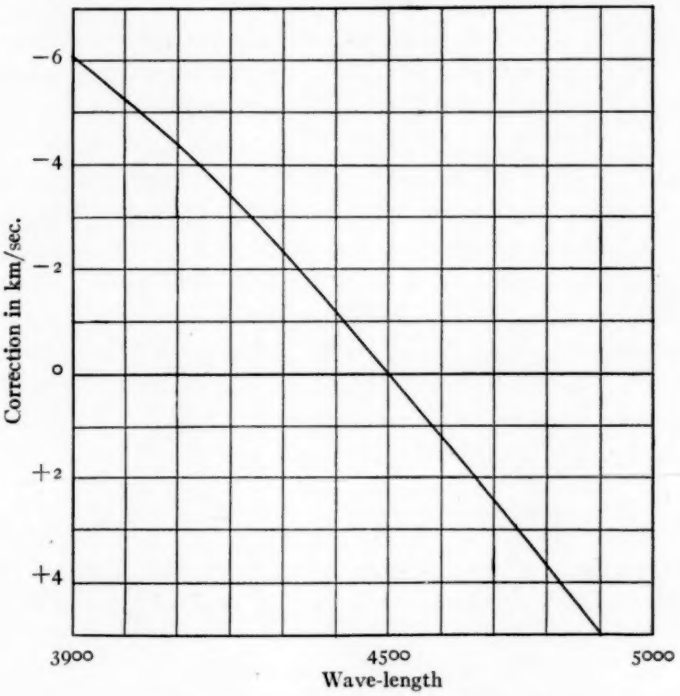

FIG. 1.—Systematic corrections for IB plates

two-prism plates were too few for an investigation of their systematic errors.

In order to make a more detailed investigation of the systematic errors for one-prism plates, we have taken for every plate the differences of the velocities for every combination of two lines. When these differences by pairs are averaged for all the plates, there is shown to be no systematic progression with wave-length. This makes it evident that the effect of coma has been removed from the results.

The separate values of these differences by pairs are, however, in most cases considerably larger than their probable errors, indicating that a still greater accuracy might perhaps be obtained from the material. The errors which are involved in our results are those due to the uncertainties of the wave-lengths of the stellar lines and of the comparison lines, to the method of reduction, and to all unknown instrumental sources. These systematic corrections can now be applied in our future reductions.

The systematic errors for all lines are uniformly scattered around zero. For most stars enough lines are measured to cancel the errors of the separate lines. The lines *He* λ4472 and *Mg* λ4481, which were measured in almost every one of these stars, have very small errors and these are of opposite sign. We therefore feel confident that our final velocities will not be affected by more than a few tenths of a kilometer from all of the foregoing sources.

Our results, nevertheless, differ systematically from those of other observatories. We can compare 159 of these stars with the values given by J. Voûte in his "First Catalogue of Radial Velocities," which is compiled largely from the Lick Observatory publications but also includes published values from the Yerkes and other observatories. The systematic difference, with regard to sign, is.

$$\text{Yerkes} - \text{Voûte} = +1.1 \text{ km/sec.}$$

A comparison of results from a large number of three-prism plates of Arcturus obtained at the Yerkes and Lick observatories gives:

$$\text{Yerkes} - \text{Lick} = +0.9 \text{ km/sec.}$$

This systematic difference is confirmed by the results for the K-term, which by our solution is +5.6 km/sec., while W. W. Campbell[1] obtained +4.1 km/sec., from 225 B stars, the greater part of which had been observed at the Lick Observatory and at its D. O. Mills station in Santiago, Chile. It should be noted that only 77 of the stars used by Campbell were situated north of the equator.

Our velocities, therefore, seem to be more positive than those of the Lick Observatory by about 1 km/sec. We have no explanation to offer for this difference.

[1] *Lick Observatory Bulletins*, 6, 123, 1911.

PRECISION OF THE VELOCITIES

The accuracy of our final velocities is indicated by the average probable error of ±3.5 km/sec. for all stars in Table II. The mean number of plates per star being 6.6, the average probable error of one plate is ±9.0 km/sec. This value is reasonable, in view of the poor character of the lines in the majority of spectra of types O and B.

CHARACTER OF SPECTRUM

It is a familiar fact to all experienced in measuring plates of stellar spectra that the classification by the letters of the Harvard system gives for the early types no indication of the suitability of the lines for a precise determination of the radial velocity. Accordingly we long ago adopted the plan of specifying for each stellar spectrum the number and the character of the lines which could be used. For the number of lines, we employed only two divisions: "many" and "few" (generally not more than five measurable lines); for the character, we used "good," "fair," and "poor." On this system, the 368 stars of this paper are grouped as follows:

Number of Stars	Number of Lines	Quality of Lines
45	Many	Good
59	Few	Good
17	Many	Fair
101	Few	Fair
7	Many	Poor
139	Few	Poor

According to the Harvard classification the number of stars in our list of class O and the subdivisions of class B are as follows: O, 19; B1, 15; B2, 25; B3, 109; B5, 68; B8, 75; B9, 35. Two stars formerly classified as B but now assigned to type Ao were included in our list. These stars are +58°607 Camelopardalis, current number 49, and 20 χ Serpentis, current number 238.

THE RADIAL VELOCITIES

Table II contains the radial velocities of the 368 stars. The columns give successively: the current number and the name of the star; its position; its visual photometric magnitude and spectral type, according to the *Henry Draper Catalogue;* the number of

plates measured; the radial velocity of the star in km/sec.; the radial velocity obtained from the calcium lines K (λ 3934) and H (λ 3969); the probable error of the average radial velocity; and the character of the lines. The following abbreviations are used: M = many; F = few; g = good; f = fair; p = poor; v = very.

The calcium velocities were derived chiefly from the K line. The H line was used when possible, though much less frequently, owing to its proximity to the hydrogen line ϵ. For all stars later than B_3 these calcium velocities (V *Ca*) were included in forming the average velocity (V). For the earlier spectral subdivisions this was not done, as their calcium lines are of the stationary type. The radial velocities of all stars not known to be spectroscopic binaries were obtained by taking the average for all plates, weighted according to the number of prisms employed. For spectroscopic binaries with known orbits the residuals of our velocities from the orbits were derived by approximate computations, and the weighted mean of all residuals was then added to the velocity of the system γ, as determined from the orbit. These values, although not as accurate as those given in the published orbits, are useful for the detection of slow changes in γ and for the investigation of systematic errors. The separate residuals are given under "Remarks to Table II." The probable errors were computed for practically all stars for which more than three plates were available. Peters' formula was used for all stars for which we had only one-prism plates. If the velocity of a star was for any reason regarded as uncertain, it was put in parentheses. For stars in which double lines were measured the average of the component velocities is given in Table II.

TABLE II

MEAN RESULTS FOR RADIAL VELOCITIES

No.	Star	α 1900	δ 1900	Mag.	Spec.	No. of Pl.	V	V_{Ca}	P.E. ±	Lines
1	10 Cas	$0^h\ 1^m.2$	+63°37′	5.5	B8	3	+ 2.0	− 5.1	6.7	F p
2	34 Psc	4.9	+10 36	5.5	B8	3	+14.6	.....	4.8	F v p
3	88 γ Peg	8.1	+14 38	2.9	B2	11	+ 5.0	.....	0.7	M g
4	12 Cas	19.3	+61 17	5.4	B9	4	+ 0.7	− 8.9	7.4	F p
5	14 λ Cas	26.2	+53 59	4.9	B8	7	−14.1	.....	4.9	F v p
6	15 κ Cas	27.3	+62 23	4.2	Bo	5	− 8.7	−17.4	2.6	M f
7	+53°102 Cas	30.5	+53 38	5.1	B5	7	− 2.7	− 5.0	1.5	F f
8	17 ζ Cas	31.4	+53 21	3.7	B3	7	+ 2.4	−13.3	0.5	F g
9	29 π And	31.5	+33 10	4.4	B3	7	+ 5.5	.....	1.4	F g
10	19 ξ Cas	36.5	+49 58	4.8	B3	17	− 9.4	−10.1	1.8	F f
11	+47°181 Cas	38.8	+47 19	5.6	B3	3	−54.0	.....	6.4	F f
12	22 ο Cas	39.2	+47 44	4.7	B2	5	− 9.0	+11.8	1.9	F f
13	23 Cas	41.1	+74 18	5.4	B8	4	+ 0.9	−13.7	6.5	F g
14	25 ν Cas	43.2	+50 25	5.0	B9	7	+ 1.0	.....	2.7	F p
15	27 γ Cas	50.7	+60 11	2.2	Bop	8	−14.4	.....	2.5	F v p
16	+59°146 Cas	50.8	+59 50	5.5	B9	4	+ 3.2	.....	14.4	F g
17	α Scl	53.8	−29 54	4.4	B5	2	+ 5.5	.....	6.3	F f
18	69 σ Psc	0 57.3	+31 16	5.5	B9	4	+16.3	+ 4.8	5.5	F g
19	42 φ And	1 3.7	+46 42	4.3	B8	3	+ 4.8	+ 8.7	4.9	F f
20	+63°149 Cas	5.0	+63 40	5.5	B9	3	−13.1	−26.9	3.1	F f
21	32 Cas	5.1	+64 29	5.5	B8	3	− 8.2	+ 0.7	8.7	F p
22	53 τ And	34.7	+40 4	4.9	B8	1	− 9.2	.....	....	M f
23	+34°297 Tri	36.3	+34 44	5.4	B8	3	− 5.7	−18.6	3.2	F f
24	54 φ Persei	37.4	+50 11	4.2	Bop	1	(− 9.6)	.....	....	F p
25	1 Persei	45.4	+54 39	5.5	B3	1	(+87.8)	.....	....	F p
26	45 ε Cas	47.2	+63 11	3.4	B3	5	− 4.9	.....	0.4	F g
27	46 ω Cas	48.2	+68 12	5.0	B8	7	−19.6	(+ 3.7)	1.8	F f
28	4 g Persei	1 55.6	+54 0	5.0	B8	9	− 7.5	.....	2.9	F f
29	24 ξ Ari	2 19.5	+10 9	5.5	B5	6	+ 9.0	(−41.2)	3.5	F p
30	82 δ Ceti	34.4	− 0 6	4.0	B2	21	+ 9.3	.....	1.0	M g
31	35 Ari	37.6	+27 17	4.6	B3	3	+ 6.3	−48.2	2.0	F f
32	37 ο Ari	39.0	+14 53	5.8	B8	3	− 6.1	.....	3.2	F p
33	89 π Ceti	39.4	−14 17	4.4	B5	3	+17.0	.....	0.6	M g
34	42 π Ari	43.7	+17 3	5.3	B5	5	+12.0	(+21.0)	1.8	F p
35	41 Ari	44.1	+26 51	3.7	B8	9	+13.1	.....	4.4	F p
36	43 σ Ari	46.0	+14 40	5.5	B5	3	+ 4.9	.....	1.3	F v p
37	+51°665 Persei	53.7	+51 57	5.4	B5	4	− 1.1	.....	6.7	F p
38	91 λ Ceti	54.4	+ 8 31	4.7	B5	3	+ 9.2	.....	1.2	F f
39	5 Eri	2 54.7	− 2 52	5.5	B9	3	− 7.6	− 3.0	4.4	M g
40	26 β Persei	3 1.7	+40 34	var	B8	3	(+18.3)	.....	....	F f
41	30 Persei	11.0	+43 39	5.4	B5	4	+ 4.4	.....	1.9	F p
42	1 H Cam	11.2	+65 17	4.8	B3p	4	+ 2.2	− 4.4	7.4	F p
43	29 Persei	11.5	+49 51	5.3	B3	4	−13.5	.....	3.8	F f
44	31 Persei	12.0	+49 43	5.1	B3	3	+34.6	.....	1.3	F p
45	61 τ Ari	15.5	+20 47	5.2	B3	3	+ 7.2	.....	1.3	F g
46	+48°899 Persei	16.1	+48 51	5.2	B3	3	+ 2.9	.....	1.4	F p
47	+48°920 Persei	20.9	+48 43	4.9	B5	3	+ 7.2	−10.7	10.1	F f
48	2 H Cam	21.0	+59 36	4.4	Bop	6	− 6.0	− 4.5	0.6	M g
49	58°607 Cam	21.9	+58 32	4.8	Aop	8	− 6.3	(−40.6)	2.4	F g
50	34 Persei	22.2	+49 10	4.7	B5	4	+14.0	.....	3.0	F p
51	+47°847 Persei	25.0	+47 41	5.5	B8	3	+ 7.7	+ 7.3	0.5	F g
52	17 Eri	25.6	− 5 25	4.8	B9	3	+34.4	.....	5.6	F f
53	19 τ^5 Eri	3 29.4	−21 58	4.3	B8	23	+15.0	.....	....	F p

TABLE II—*Continued*

No.	Star	α 1900	δ 1900	Mag.	Spec.	No. of Pl.	V	V_{Ca}	P.E. ±	Lines
54	22 Eri	3^h35^m7	− 5°32′	5.5	B8	3	+16.7	+13.9	1.4	F g
55	39 δ Persei	35.8	+47 28	3.1	B5	5	−37.8	.....	3.6	F p
56	40 *o* Persei	36.0	+33 39	5.0	B2	3	+ 2.7	.....	0.9	F g
57	13 Tauri	36.6	+19 23	5.5	B8	3	− 5.9	.....	3.5	F p
58	38 o Persei	38.0	+31 58	3.9	B1	5	+15.1	.....	3.7	M f
59	16 Tauri	38.9	+23 59	5.4	B5	4	+44.5	.....	5.4	F p
60	17 Tauri	39.0	+23 48	3.8	B5p	3	+14.5	.....	1.1	F p
61	19 Tauri	39.3	+24 10	4.4	B5	3	+ 3.5	.....	0.6	F f
62	24 Eri	39.5	− 1 29	5.1	B8	2	+ 8.8	.....	....	F p
63	20 *c* Tauri	39.9	+24 4	4.0	B5	13	+ 3.8	+ 2.9	1.8	M g
64	29 Tauri	40.3	+ 5 44	5.4	B3	2	+19.0	.....	....	F f
65	23 *d* Tauri	40.4	+23 39	4.2	B5	3	+ 5.8	.....	1.0	F f
66	25 η Tauri	41.5	+23 48	3.0	B5p	3	+14.3	.....	0.9	F f
67	+22°563 Tauri	42.5	+23 8	5.5	B8	3	+ 8.9	+45.5	12.1	F v p
68	30 *e* Tauri	42.8	+10 50	5.0	B3	3	+15.6	.....	1.8	F g
69	27 *f* Tauri	43.2	+23 45	3.8	B8	4	+12.6	.....	0.8	F p
70	28 Tauri	43.3	+23 51	5.2	B8p	6	+22.7	.....	3.2	F v p
71	30 Eri	47.7	− 5 39	5.5	B8	3	+11.9	.....	4.8	F p
72	44 ζ Persei	47.8	+31 35	2.9	B1	5	+21.6	.....	0.4	M g
73	+62°628 Cam	48.6	+62 47	4.9	B9	3	+ 3.0	−18.8	4.0	F f
74	+47°912 Persei	48.8	+47 35	5.3	B5	3	+12.6	.....	11.9	F p
75	33 τ^8 Eri	49.5	−24 55	4.8	B5	6	+15.4	+16.6	3.5	F f
76	+34°768 Persei	50.0	+34 47	5.5	B3	3	− 6.1	.....	5.2	F p
77	45 ε Persei	51.1	+39 43	3.0	B1	9	− 7.7	.....	3.1	F f
78	46 ξ Persei	52.5	+35 30	4.0	Oe5	12	+76.1	+11.3	3.6	F p
79	35 Eri	56.5	− 1 50	5.2	B5	3	+10.8	.....	2.9	F p
80	40 Tauri	$3\ 58.4$	+ 5 9	5.3	B3	3	+10.6	.....	4.2	F f
81	48 *c* Persei	$4\ 1.4$	+47 27	4.0	B3p	5	+ 0.5	.....	5.4	F p
82	−16°796 Eri	4.7	−16 39	5.4	B3	3	+19.9	+ 6.3	4.5	F f
83	+83°104 Cephei	5.0	+83 34	5.4	B3	3	+22.0	+ 1.8	4.6	F p
84	+9°550 Tauri	9.2	+ 9 46	5.2	B8	1	+11.2	.....	....	F v p
85	49 μ Tauri	10.1	+ 8 39	4.3	B3	4	+20.4	.....	2.6	F g
86	+50°973 Persei	12.6	+50 41	5.5	B3	1	(− 8.6)	.....	....	F g
87	53 Tauri	13.5	+20 55	5.4	B8	3	− 1.4	.....	....	F g
88	53 *d* Persei	14.3	+46 16	4.9	B3	4	+ 1.8	+ 3.2	1.5	F g
89	72 Tauri	21.3	+22 46	5.4	B5	4	+ 4.7	+ 0.4	6.7	F p
90	1 Cam	24.1	+53 42	5.4	B1	3	+18.8	(− 9.1)	12.1	F p
91	48 ν Eri	31.3	− 3 33	4.1	B2	20	+12.6	+15.9	2.8	F g
92	49 Eri	32.1	+ 0 48	5.3	B5	2	+16.2	+29.7	....	F f
93	93 Tauri	34.5	+12 0	5.4	B9	2	+25.8	+20.5	....	F g
94	94 τ Tauri	36.2	+22 46	4.3	B5	8	+ 9.6	.....	9.6	F g
95	57 μ Eri	40.5	− 3 26	4.2	B5	5	+24.4	.....	3.8	F f
96	9 Cam	44.1	+66 10	4.4	B0	85	+ 5.7	− 5.8	....	M g
97	3 π^4 Ori	45.9	+ 5 26	3.8	B3	5	+24.6	.....	0.9	M g
98	8 π^5 Ori	49.0	+ 2 17	3.9	B3	64	+23.4	.....	0.7	M g
99	65 ψ Eri	56.6	− 7 20	4.8	B8	4	+25.8	.....	2.8	F g
100	11 Cam	57.4	+58 50	5.3	B3p	4	−10.6	.....	3.9	F p
101	11 Ori	58.9	+15 16	4.6	B9	5	+19.1	+21.9	3.6	F f
102	10 η Aur	$4\ 59.5$	+41 6	3.3	B3	8	+ 6.2	.....	1.2	F f
103	66 Eri	$5\ 1.8$	− 4 47	5.2	B9	83	+31.5	+26.1	1.0	F f
104	103 Tauri	2.0	+24 8	5.5	B3	3	+19.4	+27.1	....	F f
105	69 λ Eri	4.4	− 8 53	4.3	B2	4	+ 3.7	.....	....	F v p
106	3 ι Lep	$5\ 7.7$	−11 59	4.5	B8	4	+34.0	.....	....	F p

TABLE II—*Continued*

No.	Star	α 1900	δ 1900	Mag.	Spec.	No. of Pl.	V	V_{Ca}	P.E. ±	Lines
107	4 κ Lep	$5^h\ 8^m.7$	−13° 3′	4.5	B8	3	+ 3.2	.....	6.1	F p
108	+34°980 Aur	9.7	+34 12	5.8	Bop	1	(+57.8)	+ 5.2	....	M g
109	19 β Ori	9.7	− 8 19	0.3	B8p	21	+21.7	+22.0	0.3	M g
110	20 τ Ori	12.8	− 6 57	3.7	B5	13	+21.5	+10.6	1.5	F g
111	20 ρ Aur	14.7	+41 43	5.1	B3	3	+ 2.7	+16.8	2.7	F f
112	6 λ Lep	15.0	−13 17	4.3	B1	4	+21.0	+15.4	2.7	M g
113	22 ο Ori	16.7	− 0 29	4.6	B3	10	+27.9	.....	1.0	M v g
114	23 Ori	17.6	+ 3 27	5.0	B3	3	+18.9	+13.8	8.9	F v p
115	8 Lep	18.9	−14 1	5.2	B3	3	+14.1	.....	6.1	F g
116	28 η Ori	19.4	− 2 29	3.4	B1	29	+35.8	.....	0.7	M f
117	25 Ori	19.6	+ 1 45	4.7	B3p	5	+18.9	.....	1.9	F p
118	24 γ Ori	19.8	+ 6 16	1.7	B2	15	+14.4	.....	1.2	F g
119	112 β Tauri	20.0	+28 31	1.8	B8	5	+14.2	+ 5.4	1.1	F f
120	115 Tauri	21.3	+17 53	5.3	B3	3	+37.5	.....	17.7	F p
121	114 Tauri	21.6	+21 51	4.8	B3	4	+19.2	+21.2	2.0	M f
122	30 ψ Ori	21.6	+ 3 0	4.7	B2	5	+25.1	.....	3.5	F f
123	32 *A* Ori	25.4	+ 5 52	4.3	B3	3	+26.1	.....	4.3	F p
124	33 n^1 Ori	26.0	+ 3 13	5.5	B3	3	+19.3	(−16.1)	5.8	M g
125	25 χ Aur	26.2	+32 7	4.9	B1	3	+ 2.8	.....	4.6	F g
126	+16°794 Tauri	26.4	+16 59	5.5	B9	1	(+23.5)	(+20.4)	....	F g
127	34 δ Ori	26.9	− 0 22	2.5	Bo	5	+18.1	.....	2.6	F f
128	36 υ Ori	27.1	− 7 23	4.6	B3	3	+20.2	.....	1.4	M v g
129	120 Tauri	27.6	+18 29	5.5	B3p	1	(+ 0.4)	(+26.3)	....	F p
130	−1°935 Ori	27.7	− 1 40	5.3	B2	5	+34.0	+24.3	0.3	M g
131	35 Ori	28.2	+14 15	5.6	B3	3	+15.5	+11.9	11.9	F p
132	121 Tauri	29.3	+23 58	5.3	B3	3	+ 3.4	+ 1.7	9.3	F f
133	37 ϕ^1 Ori	29.3	+ 9 25	4.5	Bo	55	+33.2	+16.2	0.5	M v g
134	39 λ Ori br	29.6	+ 9 52	3.7	Oe5	13	+31.8	+14.1	1.7	F f
135	39 λ Ori ft	29.6	+ 9 52	5.6	B1	3	+30.0	.....	....	F f
136	−6°1233 Ori	30.1	− 6 5	5.6	B1	4	+30.9	.....	1.5	F f
137	−6°1234 Ori	30.1	− 6 5	4.7	B1	5	+30.4	+14.6	0.8	M g
138	42 c^1 Ori	30.4	− 4 54	4.6	B3	3	+46.2	.....	4.9	F f
139	41 θ^1 Ori	30.4	− 5 27	5.4	Oe5	23	+23.5	+25.8	....	F p
140	Bond 640	30.4	− 5 27	6.5	Oe5	3	+20.5	.....	0.9	M f
141	Bond 619	30.4	− 5 27	6.8	Oe5	8	+31.9	.....	4.7	F p
142	Bond 708	30.5	− 5 29	6.3	Bo	4	+27.6	.....	2.8	F g
143	43 θ^2 Ori	30.5	− 5 29	5.2	B1	39	+45.3	+12.5	3.0	M p
144	44 ι Ori	30.5	− 5 59	2.9	Oe5	8	+19.4	.....	2.0	M p
145	46 ε Ori	31.1	− 1 16	1.8	Bo	18	+28.8	+23.7	0.7	F f
146	123 ζ Tauri	31.7	+21 5	3.0	B3p	24	+16.9	.....	0.5	F f
147	125 Tauri	33.5	+25 50	5.0	B3	3	+21.5	(+ 0.7)	3.9	M f
148	48 σ Ori	33.7	− 2 39	3.8	Bo	28	+30.6	+15.2	....	F f
149	47 ω Ori	33.9	+ 4 4	4.5	B3p	74	+21.8	+23.7	....	F f
150	126 Tauri	35.5	+16 29	4.9	B3	3	+20.0	+13.7	3.5	F f
151	50 ζ Ori br	35.7	− 2 0	2.0	Bo	7	+18.4	+15.8	0.6	F f
152	−1°1004 Ori	35.8	− 1 11	5.0	B3	5	+29.1	.....	....	F f
153	α Col	36.0	−34 8	2.8	B5p	6	+21.1	.....	5.0	F v p
154	133 Tauri	42.0	+13 52	5.2	B5	7	+28.1	+17.6	1.2	F g
155	53 κ Ori	43.0	− 9 42	2.2	Bo	9	+18.4	+ 0.2	0.5	F f
156	134 Tauri	43.9	+12 37	4.9	B9	5	+26.7	+17.2	0.8	F g
157	55 Ori	46.5	− 7 33	5.3	B3	5	+23.4	+32.1	2.9	F p
158	57 Ori	49.1	+19 44	5.9	B2	3	− 5.7	+16.2	12.9	F p
159	139 Tauri	5 51.8	+25 57	4.9	B2	6	+ 8.5	+ 7.2	4.3	F f

TABLE II—*Continued*

No.	Star	α 1900	δ 1900	Mag.	Spec.	No. of Pl.	V	V_{Ca}	P.E. ±	Lines
160	64 Ori	$5^h57^m.6$	+19°41′	5.2	B8	4	+ 4.6	(+19.1)	2.0	F g
161	62 χ^2 Ori	58.0	+20 8	4.7	B2p	6	+17.7	+14.2	1.8	M v g
162	−6°1391 Mon	5 59.4	− 6 42	5.1	B2p	5	+34.1	.....	3.5	F v p
163	−4°1362 Mon	6 1.6	− 4 11	5.4	B3	4	+21.8	+16.7	0.9	F g
164	67 ν Ori	1.9	+14 47	4.4	B2	8	+21.1	(+10.8)	0.7	M g
165	69 f^1 Ori	6.2	+16 9	4.9	B3	4	+45.2	+11.2	7.6	F v p
166	70 ξ Ori	6.3	+14 14	4.4	B3	3	+24.1	.....	....	F p
167	−6°1446 Ori	7.0	− 6 31	5.1	B3	4	+28.2	.....	2.2	M g
168	72 f^2 Ori	9.6	+16 11	5.3	B9	6	+10.1	.....	5.8	F p
169	73 Ori	10.1	+12 35	5.4	B9	4	+21.2	+ 8.9	3.1	F f
170	−19°1407 CMa	13.9	−19 56	5.3	B3	3	+30.4	+26.3	....	F f
171	7 Mon	14.9	− 7 47	5.1	B3	4	+54.3	(−12.0)	5.0	F f
172	1 ζ CMa	16.5	−30 1	3.1	B3	4	+29.7	.....	3.4	F g
173	−11°1460 Mon	16.8	−11 44	5.5	B2p	3	+36.2	.....	10.2	F p
174	2 β CMa	18.3	−17 54	2.0	B1	7	+33.0	.....	1.8	M g
175	18 ν Gem	23.0	+20 17	4.1	B5	10	+27.0	+13.0	3.7	F f
176	10 Mon	23.0	− 4 42	5.0	B3	3	+24.3	.....	3.8	M f
177	11 β Mon A	24.0	− 6 58	4.7	B3p	3	+ 8.9	(+39.5)	4.4	F f
178	11 β Mon B	24.0	− 6 58	5.2	B3p	1	(+33.8)	.....	....	F f
179	11 β Mon C	24.0	− 6 58	5.6	B3p	2	+22.6	.....	....	F f
180	4 ξ' CMa	27.6	−23 21	4.4	B1	5	+28.1	.....	2.8	M g
181	−1°1274 Mon	28.6	− 1 9	5.0	B3	4	+43.3	.....	2.5	F v p
182	−5°1710 Mon	31.6	− 5 8	5.5	B9	5	+30.6	+23.2	3.6	F f
183	52 ψ^3 Aur	31.9	+39 59	5.3	B8	4	+14.6	+30.0	2.4	F p
184	15 S Mon	35.5	+ 9 59	4.7	Oe5	5	+28.8	.....	....	M f
185	42 Cam	40.5	+67 41	5.0	B3	5	− 3.3	+12.0	....	F f
186	11 CMa	42.3	−14 20	5.2	B8	3	+21.1	.....	6.1	F v p
187	43 Cam	42.9	+69 0	5.1	B5	4	− 1.0	+12.2	4.6	F p
188	−14°1599 CMa	44.4	−15 2	5.3	B5	3	−13.8	.....	....	F f
189	15 CMa	49.2	−20 6	4.7	B1	5	+25.2	.....	1.7	F g
190	20 ι CMa	51.7	−16 55	4.4	B5	4	+41.8	+31.0	0.9	M g
191	21 ϵ CMa	54.7	−28 50	1.6	B1	7	+26.6	.....	0.3	M g
192	19 Mon	57.9	− 4 6	4.9	B3	7	+25.2	+25.8	2.6	F p
193	24 o^2 CMa	58.8	−23 41	3.1	B5p	8	+49.6	+50.3	0.6	F g
194	23 γ CMa	6 59.2	−15 29	4.1	B5	5	+34.0	+40.0	1.8	F g
195	27 CMa	7 10.2	−26 10	4.7	B5p	3	+80.0	.....	....	F f
196	28 ω CMa	10.7	−26 35	3.8	B3	6	+20.8	.....	2.5	F f
197	29 CMa	14.5	−24 23	4.9	Oe	4	−19.3	.....	10.5	F f
198	30 τ CMa	14.5	−24 47	4.4	Oe5	5	+51.3	.....	....	F f
199	−18°1806 CMa	17.8	−18 50	4.9	B8	3	+32.1	+18.4	3.2	F p
200	31 η CMa	20.1	−29 6	2.4	B5p	6	+42.0	.....	0.7	M g
201	3 β CMi	21.7	+ 8 29	3.1	B8	7	+27.7	.....	6.2	F p
202	13 ζ CMi	7 46.5	+ 2 1	5.1	B8	5	+41.1	+32.4	3.6	F f
203	ζ Puppis	8 0.1	−39 43	2.3	Od	5	−28.5	.....	4.9	F v p
204	16 Argus	4.5	−18 57	4.3	B3	10	+14.8	.....	2.4	M p
205	7 η Hydrae	38.0	+ 3 46	4.3	B3	7	+23.8	.....	....	F p
206	α Pyx	39.6	−32 50	3.7	B2	3	+ 9.9	.....	1.8	M f
207	14 Hydrae	8 44.3	− 3 4	5.2	B9	5	+35.1	+27.6	2.4	F f
208	76 κ Cancri	9 2.4	+11 4	5.1	B8	26	+24.1	.....	....	M f
209	19 Hydrae	3.8	− 8 11	5.5	B8	5	+23.1	.....	6.4	F p
210	36 Lyncis	7.3	+43 38	5.3	B8	5	+22.6	.....	3.6	F g
211	24 Hydrae	11.8	− 8 19	5.5	B9	4	+ 9.5	− 8.8	5.2	F g
212	38 κ Hydrae	9 35.5	−13 53	5.0	B3	5	+24.0	.....	4.2	M p

TABLE II—*Continued*

No.	Star	α 1900	δ 1900	Mag.	Spec.	No. of Pl.	V	V_{Ca}	P.E. ±	Lines
213	40 ν^2 Hydrae	10h 0m3	−12°35′	4.7	B8	6	+37.4	(+14.9)	....	F f
214	32 α Leonis	3.0	+12 27	1.3	B8	7	+ 3.1	(−34.8)	3.3	F v p
215	29 δ Sex	24.4	− 2 14	5.2	B9	9	+27.9	+33.0	3.3	F p
216	30 Sex	25.2	− 0 8	5.0	B5	6	+12.8	+10.9	2.7	F f
217	−12°3181 Hyd	26.1	−13 5	5.5	B9	3	+19.8	.....	15.0	F p
218	47 ρ Leonis	27.5	+ 9 49	3.8	Bop	7	+37.0	+ 4.1	0.8	M g
219	42 LMi	10 40.3	+31 13	5.4	B9	2	+42.3	.....	....	F v p
220	90 Leonis	11 29.5	+17 22	5.8	B3	4	−14.4	.....	4.1	F p
221	21 θ Crt	31.6	− 9 15	4.8	B9	4	+24.2	.....	4.9	F p
222	31 Corvi	11 55.8	−19 6	5.3	B3	4	+12.3	.....	9.8	F f
223	4 γ Corvi	12 10.7	−16 59	2.8	B8	9	− 4.2	.....	0.9	F g
224	5 κ Dra	12 29.2	+70 20	3.9	B5p	11	−13.1	.....	2.8	F p
225	14 CVn	13 1.1	+36 20	5.1	B9	4	+ 8.4	−21.5	5.9	F p
226	67 α Vir	19.9	−10 38	1.2	B2	8	(+11.2)	.....	....	F p
227	85 η UMa	13 43.6	+49 49	1.9	B3	19	−10.9	(− 7.3)	1.6	F p
228	−17°4046 Vir	14 9.9	−17 44	5.6	B9	3	−22.4	.....	7.7	F p
229	108 Vir	14 40.4	+ 1 9	5.5	B9	7	−24.1	−29.1	4.0	F p
230	27 β Librae	15 11.6	− 9 1	2.7	B8	7	−34.7	.....	5.3	F p
231	50 Boötis	17.8	+33 17	5.4	B9	5	(+43.6)	.....	....	F p
232	35 ζ^2 Librae	27.3	−16 31	5.6	B3	3	+26.7	.....	3.2	F p
233	4 θ CrB	28.9	+31 42	4.2	B5	5	−21.9	.....	7.5	F v p
234	−8°4010 Librae	29.0	− 8 51	5.2	B5	4	+ 1.8	.....	0.9	F g
235	40 τ Librae	32.6	−29 27	3.8	B3	3	− 9.9	.....	3.6	F p
236	7 ζ CrB	35.6	+36 58	5.1	B8	6	− 2.9	.....	3.4	F p
237	7 ζ CrB ft	35.6	+36 58	.....	B8	1	(+ 5.5)	.....	....	F p
238	20 χ Ser	37.1	+13 10	5.3	Aop	1	(+20.0)	.....	....	M p
239	25 A^2 Ser	40.9	− 1 30	5.4	B8	3	+ 1.8	−10.3	5.3	F g
240	48 Librae	52.6	−13 59	4.7	B3p	4	−10.2	− 7.2	3.2	F f
241	6 π Sco	52.8	−25 50	3.0	B2	7	(−21.0)	.....	....	F p
242	7 δ Sco	54.4	−22 20	2.5	Bo	8	−19.2	.....	....	F p
243	6 υ Her	59.6	+46 19	4.6	B9	5	− 2.0	+ 2.9	2.7	F g
244	8 β Sco br	15 59.6	−19 32	2.9	B1	4	+ 0.5	.....	3.9	F p
245	9 ω^1 Sco	16 1.0	−20 24	4.1	B2	3	+ 1.7	.....	2.8	F p
246	11 ϕ Her	5.6	+45 12	4.2	Bop	6	−15.6	−24.3	1.2	M g
247	14 ν Sco	6.2	−19 12	4.3	B3	5	− 2.8	.....	3.0	F f
248	19 UMi	13.7	+76 8	5.5	B8	3	+ 1.9	(−32.4)	2.5	F p
249	20 σ Sco	15.1	−25 21	3.1	B1	4	(−33.4)	(−21.9)	....	F f
250	22 τ Her	16.7	+46 33	3.9	B5	9	−12.7	−13.7	0.6	M v g
251	5 ρ Oph	19.6	−23 13	5.2	B5	3	− 8.5	.....	8.1	F p
252	7 χ Oph	21.2	−18 14	4.8	B3p	4	− 5.6	.....	3.6	M f
253	15 A Dra	28.2	+68 59	5.0	B8p	4	− 9.2	−42.8	3.4	F p
254	23 τ Sco	29.7	−28 1	2.9	Bo	4	− 5.9	+ 0.1	3.6	M g
255	13 ζ Oph	31.7	−10 22	2.7	Bo	6	−34.8	− 8.0	13.4	F v p
256	25 ι Oph	16 49.3	+10 20	4.3	B8	6	−11.3	− 0.9	3.5	F p
257	22 ζ Dra	17 8.5	+65 50	3.2	B5	5	−12.2	.....	0.7	M g
258	68 u Her	13.6	+33 12	var	B3	6	−11.9	.....	4.8	F f
259	42 θ Oph	15.9	−24 54	3.4	B3	4	+ 2.3	.....	2.2	F g
260	+20°3481 Her	22.5	+20 10	5.4	B5	5	+11.4	.....	....	F p
261	57 μ Oph	32.4	− 8 3	4.6	B8	6	−18.2	.....	3.3	F f
262	85 ι Her	36.6	+46 4	3.8	B3	14	−18.0	−25.2	0.7	F g
263	66 Oph	55.3	+ 4 23	4.8	B3	5	− 1.4	.....	....	F p
264	67 Oph	55.6	+ 2 56	3.9	B5p	5	+ 0.5	− 9.7	0.7	M v g
265	96 Her	17 58.1	+20 50	5.1	B3	10	−14.3	−18.3	1.2	F v g

TABLE II—*Continued*

No.	Star	α 1900	δ 1900	Mag.	Spec.	No. of Pl.	V	V_{Ca}	P.E. ±	Lines
266	102 Her	$18^h\ 4^m4$	+20°48′	4.3	B3	9	−13.3	−20.4	1.2	M g
267	13 μ Sgr	7.8	−21 5	4.0	B8p	21	− 7.4	.....	....	F g
268	+42°3035 Lyrae	12.5	+42 8	5.4	B5	5	−20.8	+23.7	....	F p
269	+30°3223 Lyrae	29.0	+30 29	5.4	B8	4	−12.2	−16.8	1.2	F f
270	+33°3154 Lyrae	32.9	+33 23	5.5	B8	3	−24.7	−23.6	3.5	F g
271	27 φ Sgr	39.4	−27 6	3.3	B8	10	+23.9	+18.4	....	F g
272	4 Aql	39.8	+ 1 57	5.0	B5	4	−23.3	.....	5.7	F p
273	112 Her	48.0	+21 18	5.3	B9	6	−14.6	+29.0	3.5	M p
274	−15°5143 Scuti	49.0	−15 43	5.0	B5	3	+ 2.0	− 0.4	1.0	F f
275	34 σ Sgr	49.1	−26 25	2.1	B3	3	− 6.8	(−66.4)	2.9	F p
276	11 δ′ Lyrae	50.2	+36 51	5.5	B3	8	(+ 0.1)	.....	....	F f
277	−13°5172 Sgr	53.8	−12 58	5.4	B5	3	−19.9	.....	1.6	F f
278	+26°3429 Lyrae	57.2	+26 9	5.5	B3	3	− 6.3	.....	6.8	F p
279	+50°2708 Dra	18 57.7	+50 24	5.2	B3	4	−12.5	.....	1.9	M g
280	16 λ Aql	19 0.9	− 5 2	3.6	B9	7	− 2.9	.....	3.5	F p
281	18 Y Aql	2.3	+10 55	5.1	B8	4	−15.1	.....	2.9	F f
282	18 ι Lyrae	3.7	+35 57	5.1	B5	4	− 8.8	.....	7.4	F p
283	20 Aql	7.3	+ 8 7	5.4	B3	3	−10.6	.....	5.9	F p
284	21 Aql	8.7	+ 2 7	5.1	B8	3	− 3.5	− 9.8	0.4	F g
285	20 η Lyrae	10.4	+38 58	4.5	B3	5	− 7.8	.....	0.6	M g
286	1 Vul	11.9	+21 13	4.6	B5	13	−21.5	−26.3	1.8	F f
287	2 Vul	13.5	+22 51	5.4	Bo	3	+22.8	.....	5.4	F f
288	46 υ Sgr	16.0	−16 8	4.4	B8p	24	+ 6.9	.....	0.7	M g
289	3 Vul	18.7	+26 4	4.9	B5	13	−13.1	.....	2.1	F f
290	2 Cygni	20.2	+29 26	4.9	B3	5	−15.7	+ 2.8	2.2	F f
291	8 Cygni	28.1	+34 14	4.8	B3	5	−19.7	−23.3	0.6	F g
292	9 Vul	30.2	+19 33	4.9	B8	4	+19.9	.....	5.7	F v p
293	39 κ Aql	31.5	− 7 15	5.0	Bo	9	−15.8	− 9.2	7.8	M p
294	41 ι Aql	31.6	− 1 31	4.3	B5	3	−26.5	.....	0.9	F p
295	44 σ Aql	34.3	+ 5 10	5.2	B3	4	(−24.2)	.....	....	F p
296	14 Cygni	36.2	+42 35	5.4	B8	8	−21.5	−25.2	....	F g
297	12 Vul	46.8	+22 21	4.9	B3	4	− 4.1	.....	3.9	F p
298	23 Cygni	51.2	+57 16	5.0	B5	4	−34.0	.....	5.7	F f
299	22 Cygni	52.3	+38 13	4.9	B3	10	−17.0	−26.8	2.0	F g
300	11 Sge	53.2	+16 31	5.4	B9	3	−15.1	−38.0	4.1	F p
301	+30°3837 Cygni	54.7	+30 42	5.4	B8	3	− 8.3	.....	2.1	F p
302	25 Cygni	19 56.2	+36 46	5.2	B3	3	+ 4.4	+39.8	0.7	F p
303	17 Vul	20 2.5	+23 19	5.1	B3	4	+16.6	+58.7	9.3	F f
304	28 b^2 Cygni	5.7	+36 33	4.8	B2p	3	−16.8	.....	....	F p
305	+25°4165 Vul	11.0	+25 17	4.8	B3	5	− 5.0	+ 0.9	....	F p
306	1 κ Cephei	12.3	+77 25	4.4	B9	6	−21.8	−23.2	1.1	M g
307	10 π Cap	21.6	−18 32	5.2	B8	3	− 2.2	.....	3.3	F f
308	45 ω^1 Cygni	27.0	+48 37	4.9	B3	4	−31.0	.....	1.5	F f
309	2 ε Del	28.4	+10 58	4.0	B5	6	−19.9	−20.8	1.3	F v g
310	14 τ Cap	33.7	−15 18	5.3	B5	3	−19.7	−20.8	6.0	F f
311	28 Vul	34.2	+23 46	5.0	B5	3	−14.8	.....	4.6	F p
312	9 α Del	35.0	+15 34	3.9	B8	4	− 0.4	−18.5	3.1	F p
313	51 Cygni	39.1	+49 59	5.4	B3	3	− 5.5	−18.8	1.8	F g
314	54 λ Cygni	43.5	+36 7	4.5	B5	6	−21.1	− 3.0	2.8	F p
315	55 Cygni	45.5	+45 45	4.9	B2	9	− 7.7	− 7.8	....	M v g
316	5 Aqr	46.8	− 5 52	5.5	B8	3	+ 6.4	−11.6	1.4	F f
317	57 Cygni	49.7	+44 0	4.7	B3	4	−15.6	.....	8.1	F g
318	+46°3111 Cygni	20 52.5	+47 2	5.9	B8p	3	−21.0	−22.1	4.3	F g

TABLE II—*Continued*

No.	Star	α 1900	δ 1900	Mag.	Spec.	No. of Pl.	V	V_{Ca}	P.E. ±	Lines
319	+49°3426 Cygni	20h55m3	+50° 4′	5.5	B8	3	−27.4	+ 1.2	1.4	F p
320	59 f^1 Cygni	56.4	+47 8	4.9	Bop	3	+ 8.9	.....	....	F f
321	60 Cygni	20 57.6	+45 46	5.2	B3	3	+ 3.5	+16.3	5.6	F p
322	+59°2334 Cephei	21 9.3	+59 35	5.6	B2	4	−14.9	− 2.7	1.3	F g
323	66 υ Cygni	13.8	+34 29	4.4	B3p	5	−14.1	.....	3.6	F p
324	68 *A* Cygni	14.8	+43 31	5.1	Oe5	3	+12.9	−18.3	....	F v p
325	6 Cephei	17.3	+64 27	5.2	B3p	3	−27.0	.....	....	F p
326	70 Cygni	23.2	+36 41	5.2	B3	4	−23.6	.....	7.9	F p
327	7 Cephei	25.8	+66 22	5.4	B5	3	+12.6	+ 5.4	3.6	F p
328	8 β Cephei	27.4	+70 7	3.3	B1	12	(− 7.3)	.....	....	M g
329	39 ϵ Cap	31.5	−19 54	4.7	B5p	1	(−22.1)	− 0.7	....	M f
330	9 Cephei	35.2	+61 38	4.9	B2p	4	−15.5	+ 5.0	2.7	M g
331	+56°2617 Cephei	35.9	+57 2	5.6	Oe5	1	(−24.1)	.....	....	F f
332	80 π^1 Cygni	38.6	+50 44	4.8	B3	6	−16.2	−31.9	3.2	F f
333	81 π^2 Cygni	43.1	+48 51	4.3	B3	5	−17.8	−25.2	1.3	F g
334	16 Pegasi	48.5	+25 27	5.0	B3	8	− 3.8	+11.7	3.1	F f
335	+55°2639 Cyg br	48.8	+55 20	5.5	B3	3	+25.6	+ 5.0	....	F p
336	13 Cephei	51.5	+56 8	6.0	B9p	14	−12.5	−12.7	2.1	M g
337	31 *o* Aqr	21 58.1	− 2 38	4.7	B5p	4	+ 6.4	.....	2.4	F f
338	33 ι Aqr	22 1.0	−14 21	4.4	B8	5	−14.0	.....	....	F p
339	19 Cephei	2.1	+61 48	5.2	Oe5	6	−15.5	(+12.5)	....	M f
340	38 *e* Aqr	5.2	−12 4	5.4	B5	3	+ 4.3	.....	1.9	F g
341	22 λ Cephei	8.1	+58 56	5.2	Od	4	−70.2	−12.1	6.4	F v p
342	46 ρ Aqr	14.9	− 8 19	5.4	B8	3	−14.9	.....	7.5	F f
343	30 Pegasi	15.5	+ 5 17	5.4	B5	3	− 7.8	− 9.0	1.3	F g
344	31 Pegasi	16.6	+11 42	4.9	B3p	5	+10.8	.....	3.9	M f
345	32 Pegasi	16.7	+27 50	4.9	B8	4	+10.5	± 2.3	2.0	F f
346	2 Lac	16.9	+46 2	4.7	B5	4	− 7.0	.....	....	F f
347	52 π Aqr	20.2	+ 0 52	4.6	B1p	10	+ 2.8	−17.6	3.4	F p
348	4 Lac	20.4	+48 58	4.6	B8p	6	−25.1	.....	1.9	M f
349	6 Lac	26.1	+42 36	4.5	B3	7	−13.0	− 8.9	....	F f
350	62 η Aqr	30.2	− 0 38	4.1	B8	4	+ 3.2	.....	6.3	F v p
351	8 Lac	31.4	+39 7	5.9	B5	3	(+30.3)	(−50.0)	....	F v p
352	10 Lac	34.8	+38 32	4.9	Oe5	20	−10.2	− 9.3	....	M v g
353	42 ζ Peg	36.5	+10 19	3.6	B8	7	+10.2	.....	2.8	F p
354	12 Lac	37.0	+39 43	5.2	B2	3	(− 7.7)	−24.7	....	F g
355	16 Lac	51.9	+41 4	5.5	B3	31	− 7.7	−22.3	1.0	F f
356	+47°3985 Lac	52.7	+48 9	5.2	B3	5	− 4.9	.....	....	M f
357	1 *o* And	57.3	+41 47	4.2	B5	5	−16.6	.....	2.3	F f
358	4 β Psc	22 58.8	+ 3 17	4.6	B5p	14	− 1.8	.....	1.9	F p
359	1 Cas	23 2.4	+58 53	4.9	B1	6	− 8.5	− 3.2	1.2	M g
360	58 Pegasi	5.0	+ 9 17	5.3	B8	3	+30.4	.....	7.5	F p
361	93 ψ^2 Aqr	12.7	− 9 44	4.6	B5	8	− 8.0	.....	4.9	F p
362	64 Pegasi	17.0	+31 16	5.4	B8	5	+11.6	.....	4.5	F f
363	1Hev Cas	25.4	+58 0	4.9	B3	4	−16.3	.....	....	F p
364	17 ι And	33.2	+42 43	4.3	B8	14	0.0	+ 2.6	1.3	M g
365	18 And	34.3	+49 55	5.3	B9	4	+ 9.0	.....	6.5	F p
366	106 ι^1 Aqr	39.0	−18 50	5.3	B8	3	+27.1	.....	6.3	F v p
367	8 σ Cas	53.9	+55 12	4.9	B2	5	− 7.4	.....	1.5	F p
368	29 Psc	23 56.7	− 3 35	5.2	B8	4	+18.6	− 2.5	1.1	F f

REMARKS ON TABLE II

ABBREVIATIONS USED

A.O.	*Publications of the Allegheny Observatory*	*L.O.*	*Publications of the Lick Observatory*
		L.O.B.	*Bulletins of the Lick Observatory*
Det.O.	*Publications of the Astronomical Observatory of the University of Michigan*	*Low.O.*	*Bulletins of the Lowell Observatory*
		Mt.W.	*Contributions from the Mount Wilson Observatory*
D.O.	*Publications of the Dominion Observatory, Ottawa*	*R.A.S.C.*	*Journal of the Royal Astronomical Society of Canada*
D.A.O.	*Publications of the Dominion Astrophysical Observatory*	*Y.O.*	Yerkes Observatory
		S.B.	Spectroscopic Binary

3. S.B., *L.O.* Our results show a range of 13 km/sec., in accordance with *L.O.*
4. The large range in the individual velocities is probably due to the poor lines.
5. Probably S.B.
6. S.B., *L.O.* Our range is 19 km/sec. The measures are consistent.
7. The *Ca* line K is very diffuse and hardly visible.
8. S.B., *Y.O.* The orbit was determined by Jordan (*A.O.*, **2**, 45, 1910). Our observations are well represented by his elements. The value $\gamma = +5.5$ km/sec. was derived from this comparison.
10. S.B., *Y.O.* The early plates were measured two or three times each, but give very inconsistent results. On June 4, 1923, and December 8, 1923, the lines are double. Table III contains only the average velocities. No duplicities could be detected on any of the other plates.
11. S.B., *Y.O.* Orbit not known.
12. The *Ca* velocity is based on one measurement only.
13. S.B., *Mt.W.* Young's orbit (*D.O.*, **2**, 181, 1915) gives a large deviation for one plate. Our observations are not sufficient in number to improve the orbit. The value given in Table II is the average obtained from the four plates.
15. Probably S.B. The velocities in column V of Table III are those obtained from the emission lines. The velocities obtained from the absorption lines are given in the column "Remarks." The average difference, "emission−absorption," is −22.9 km/sec. This value seems very large. R. H. Curtiss (*Det.O.*, **2**, 26, 1916, Table XV) finds that on the average this difference is negligible. K is not distinctly visible on our plates.
16. S.B., *Y.O.* Orbit not known.
17. Probably S.B., *L.O.*
18. S.B., *L.O.* Orbit not known.
19. The change in velocity between 1910 and 1920 seems real.
22. S.B., *L.O.* P. W. Merrill finds double lines. The lines are single on our plates, indicating that the velocity is nearly that of the center of mass of the system.
24. S.B., *L.O.* The velocity given in Table II is obtained from the bright lines only. This velocity is in satisfactory agreement with J. B. Cannon's orbit (*R.A.S.C.*, **4**, 199, 1910). The residual (O.−C.) = −12.8 km/sec., corresponding to $\gamma = -9.6$ km/sec., instead of $\gamma = +3.2$ km/sec., as given by Cannon.
25. S.B., *Mt.W.* The velocities in Table III are averages of the two spectral components given separately under "Remarks."
27. S.B., *Mt.W.* The representation of our observations by means of Young's orbit (*D.O.*, **2**, 102, 1915) leads to the following residuals: +4.6; +14.0; −4.1; −7.3; +10.5; +2.4; +16.1.

The most probable value of γ derived from these residuals is -19.6 km/sec. The *Ca* velocity in Table III is derived from one plate only, and cannot be regarded as reliable, inasmuch as the *Ca* lines in this star seem to share the periodic oscillations of the other lines.

28. S.B., *Y.O.* Orbit not known.
29. S.B., *Mt.W.* Two components are visible on most of the plates. The *Ca* velocity is not reliable.
30. S.B., *Y.O.* The velocity curve is variable according to Henroteau.
33. S.B., *L.O.* The range is probably small.
34. S.B., *Mt.W.* The representation of our observations by means of Young's orbit (*D.O.*, **4**, 69, 1917) is very satisfactory and leads to the following residuals: $+9.8$; $+2.2$; -6.9; $+9.3$; $+6.6$ km/sec. Young's period is sufficiently correct, but the γ-velocity derived from our observations is $+12.0$ instead of $+7.8$ as found by Young. The *Ca* velocity in Table III is the mean from three plates. As the *Ca* lines in this star share the oscillations of the other lines and since the three plates in which K was measured were all taken at or near the time of maximum velocity, this mean cannot be regarded as representing the real *Ca* velocity of the system.
35. S.B., *Y.O.* Orbit not known.
37. Suspected S.B.
40. Algol. The elements of this star are variable, and its period cannot be represented by a simple formula. In this case we have not attempted to represent our three observations by using the orbit of McLaughlin (*Astrophysical Journal*, **60**, 22, 1924), which is the best known at present. The average of our three plates is $+18.3$ km/sec., which value is placed in parentheses in Table II.
42. S.B., *Det.O.* The hydrogen lines are bright and variable. Only absorption lines were used for deriving the velocities of Table III.
47. S.B., *Y.O.* Orbit not known.
49. S.B., *L.O.* Orbit not known. Formerly classified as B9.
52. The range is large but the poor quality of the plates prevents its designation as a S.B.
53. S.B., *Y.O.* The orbit was determined by Struve after completion of this paper. From 40 plates, obtained partly during 1925–1926, he finds $P=6^{d}.2$ and $\gamma=+15.0$ km/sec. A provisional value of $+13.0$ km/sec. was used in our determination of the sun's motion.
56. S.B., *D.O.* Harper (*R.A.S.C.*, **13**, 237, 1919) noticed in the spectrum of this star a sharp line of unknown origin the wave-length of which he determined as 4070.118 A. This line is conspicuous on our plates also. In addition, our plates show the line at λ 4470.046 A (*Astrophysical Journal*, **62**, 198, 1925). The appearance of these two lines in the spectrum of the same star suggests a common origin.
57. S.B., *Mt.W.* Orbit not known.
58. S.B., *Y.O.* Jordan's orbit (*A.O.*, **2**, 63, 1910) gives the following residuals: $+4.8$; $+9.4$; -1.3; -23.0 ; -6.0 km/sec., which would make $\gamma=+15.1$ km/sec. Jordan gives $\gamma=+18.5$ km/sec. Ludendorff finds from Potsdam observations (*A.N.*, **188**, 211, 1911) $\gamma=+8$ km/sec.
59. Celaeno.
60. Electra.
61. Taygeta.
62. S.B., *Mt.W.* Orbit not known.
63. Maia. S.B., *Y.O.* Merrill (*Det.O.*, **1**, 138, 1914) finds no certain change in the velocity. In taking the average, all plates were given equal weight.
64. S.B., *D.A.O.* Orbit not known.
65. Merope.

66. Alcyone.
67. Probably S.B. Spectrum very poor.
69. Atlas.
70. Pleione.
74. S.B., *Y.O.* Orbit not known.
75. S.B., *Y.O.* Orbit not known.
77. S.B., *Y.O.* The lines are double on some of the plates. Average velocities are given in Table III.
78. S.B., *Y.O.* Cannon's orbit was based upon the *Ca* velocities only. The residuals are given in his paper (*D.O.*, **1**, 370, 1912). They are large as compared with the semi-amplitude of 7.9 km/sec. For this reason simple averages are given in Table II.
81. S.B., *D.A.O.* Orbit not known. Double *Ca* lines were suspected on one plate (October 23, 1903), giving velocities of -88 and -14 km/sec., respectively.
84. Only one observation. This star was previously classified as Ao.
86. S.B., *Mt.W.* Orbit not known. Only one observation.
87. S.B., *L.O.* The average from our three plates is given in Table II.
90. Probably S.B.
91. S.B., *Y.O.* F. Henroteau finds short-periodic oscillations and changes in the shape of the velocity curve.
94. S.B., *Y.O.* Our observations confirm Parker's orbit (*Report of the Chief Astronomer, Dominion of Canada*, **1**, 166, 1910). The observation of November 10, 1922, was used to improve Parker's period. The new value is 1.504722 days. The error may amount to two or three units in the last place. The residuals obtained from Parker's orbit are unexpectedly large and lead to $\gamma = +9.6$ km/sec. with a P.E. of ± 9.6 km/sec. These residuals have no systematic character and must be due chiefly to errors of measurement.
95. S.B., *Y.O.* Orbit not known.
96. S.B., *Y.O.* The radial velocities of this star have been investigated by O. J. Lee (*Astrophysical Journal*, **37**, 1, 1913), who finds that the *Ca* lines H and K show variable radial velocities. His orbit for the *Ca* lines shows a range of only 18 km/sec., and for this reason the average of all measures is given in Table II. These measures are essentially those of Lee, corrected for systematic errors.
97. S.B., *Y.O.* Baker's orbit (*A.O.*, **1**, 107, 1909) gives the following residuals for the three-prism plates: $+5.0$; $+1.5$; -1.7; $+0.4$ km/sec. This would give $\gamma = +24.6 \pm 0.9$ km/sec.
98. S.B., *Y.O.* The orbit of this star was determined by Lee on the basis of the same material as used here (*Astrophysical Journal*, **38**, 175, 1913). Systematic errors require a correction of -0.8 to γ as found by Lee. The velocity of the first plate does not agree with that given in Lee's paper, and was omitted in forming the correction to γ. The *Ca* lines share the oscillations of the other lines but the material is insufficient to derive γ from the *Ca* lines only. The range seems to be nearly the same as for the other lines.
99. S.B., *L.O.* Orbit not known.
101. S.B., *Y.O.* Orbit not known.
102. Suspected to be a S.B. by Henroteau at Ottawa (*D.O.*, **5**, 62, 1921).
103. S.B., *Y.O.* The measures are difficult on account of the existence of two equal components. The corrections due to systematic errors are small compared with the probable error of γ. The *Ca* velocities agree with those of the other lines.
104. S.B., *Mt.W.* Orbit not known.
105. S.B., *D.O.* Orbit not known. The range shown by our plates is 70 km/sec.
106. Probably S.B.

108. S.B., *Mt.W.* Only one plate.

109. S.B., *D.O.* The orbit of this star was determined by J. S. Plaskett (*Astrophysical Journal*, **30**, 26, 1909). He discussed the Yerkes observations and found that they conform in general to his orbit, with some exceptions, however. Since the range in V is small it seemed best to take the simple average for Table II. The resulting value is +21.7 km/sec. There seems to be no progressive change in γ from 1901 to 1902. For 1903 Ludendorff finds $\gamma = +17$ km/sec. (*A.N.*, **183**, 10, 1909), which would indicate that γ is variable.

110. S.B., *Y.O.* Orbit not known.

111. S.B., *Mt.W.* Orbit not known.

113. S.B., *Y.O.* Orbit not known.

115. Probably S.B.

116. S.B., *Y.O.* The first orbit of this star was determined by Adams (*Astrophysical Journal*, **17**, 68, 1903). A rediscussion of the Yerkes observations together with some Vienna observations was made by Hnatek (*A.N.*, **217**, 53, 1922). His final value for the velocity of the system is $\gamma = +37.0$ km/sec. The Yerkes observations would require a correction of −1.2 km/sec. to this value on account of systematic errors. The probable error has been estimated in this case.

118. S.B., *Y.O.* Orbit not known. All plates were given equal weight in forming the average velocity for Table II.

120. Probably S.B.

121. S.B., *D.O.* Orbit not known.

122. S.B., *Y.O.* The period derived by J. S. Plaskett (*Astrophysical Journal*, **28**, 266, 1908) closely represents our observations, but the residuals are all positive: +12.4; +3.5; +2.3; +16.1; +31.2 km/sec. These residuals would indicate that $\gamma = +25.1$ km/sec., instead of $\gamma = +12.0$ km/sec., as derived by Plaskett. This difference seems to prove that the velocity of the system is not constant. All plates were given equal weight.

125. S.B., *Y.O.* Young's orbit (*D.O.*, **4**, 1, 1916) leads to the following residuals: +14.5; −3.5; −2.0 km/sec.

126. S.B., *D.A.O.* Orbit not known. Only one observation.

127. S.B., Meudon. The most recent determination of the orbit of this star was made by Hnatek (*A.N.*, **213**, 17, 1920). The residuals obtained by means of this orbit are −3.7; −14.0; −7.2; +7.1; +2.5 km/sec., indicating that γ as derived from the Yerkes plates is +18.1 km/sec. This result is interesting in view of the fact that Jordan finds a still smaller value, $\gamma = +15.2$ km/sec., while all other modern determinations give more than +20 km/sec. These differences may be interpreted as being due to real changes in the velocity of the system. Using all available data and assuming that the values O.−C. as computed by Jordan (*A.O.*, **3**, 133, 1914) can be interpreted as being due to differences in γ only, we obtain the table shown on page 22.

The data collected in this table are not sufficient to settle the question as to the variability of γ. There is some indication that γ changes with a period of about twenty years, with minima at 1890 and 1910, and maxima at 1900 and 1920. More observations will be needed to establish this period.

129. Only one observation. Formerly classified as Ao.

131. Probably S.B.

132. Probably S.B.

133. S.B., *Y.O.* The orbit by Struve (*Astrophysical Journal*, **63**, 60, 1926) is based on the corrected velocities. The probable error is estimated.

135. S.B., *D.A.O.* Orbit not known.

138. S.B., *Y.O.* Orbit not known.

139. S.B., *Y.O.* Orbit not known. Our observations and those of J. S. Plaskett indicate a fairly large range (*D.A.O.*, **2**, 305, 1924).

141. S.B., *Y.O.* Orbit not known.

143. S.B., *Y.O.* The velocities used for Struve's orbit (*Astrophysical Journal*, **60**, 159, 1924) were those which resulted from the two helium lines 4472 and 4686. It was thought best to use in Table III all measured lines which are of stellar origin. This necessitated a considerable correction to the velocity of the system. The probable error was estimated.

γ-VELOCITIES OF 34 δ ORIONIS (NO. 127)

Year	Km/Sec.	Observatory	Remarks
1888, 1889, 1891	+ 6.2	Potsdam	Vogel-Scheiner (Uncertain)
1899, 1900	22.9	Meudon	Deslandres (Uncertain)
1900	15.4	Lick	Wright (Only 3 observations; uncertain)
1900, 1901, 1902, 1903	22.8	Potsdam	
1904, 1905, 1906	18.1	Yerkes	
1908, 1909, 1910, 1911, 1912	15.2	Allegheny	
1913, 1914 ?	20.2	Detroit	
1920	+21.2	Vienna	

144. S.B., *Y.O.* Plaskett and Harper's orbit (*Astrophysical Journal*, **30**, 379, 1909) gives a satisfactory representation for all observations except that of October 24, 1903, which gives a residual O.−C. = −58.8 km/sec. The other residuals are +2.7; −1.7; −11.3; −6.4; +13.5; −18.4; −2.9 km/sec. Since there is obviously an error in the observation of October 24, 1903, it was excluded from the discussion. The secondary oscillation, found by Plaskett, was neglected in the representation. The probable error was estimated.

145. S.B., *Y.O.* Orbit not known. All plates were given equal weight.

146. S.B., *Y.O.* The original measures of this star made by Adams and used by him for a determination of the orbit (*Astrophysical Journal*, **22**, 115, 1905) were not at hand during this compilation. For this reason they are not included in Table III. The values published by him were based upon the $H\gamma$ line only. According to the wave-length adopted in this paper for $H\gamma$, a correction of +0.5 km/sec. was applied to all velocities. The probable error was estimated. Miss H. M. Losh finds that the period and the γ-velocity of this star are variable (*Popular Astronomy*, **32**, 557, 1924).

147. S.B., *Y.O.* The orbit by Cannon (*D.O.*, **3**, 409, 1916) gives the following residuals for the Yerkes measures: +12.6; −2.4; +10.1 km/sec. The correction to γ would be +6.7 km/sec. The *Ca* velocity depends on one plate only.

148. S.B., *Y.O.* Orbit not known.

149. S.B., *Y.O.* Orbit not known. The hydrogen lines are greatly complicated by the presence of variable emission lines (Struve, *Astrophysical Journal*, **58**, 138, 1923). This may have affected the results. The velocities from the hydrogen lines seem to differ systematically from those of the other lines. They were included, however, in the values given in Table III. For a determination of the orbit it will undoubtedly be necessary to use only the helium lines and the magnesium line λ 4481.

151. S.B., *Det.O.* Orbit not known. All plates were given equal weight.

152. S.B., *Y.O.* The representation by means of an orbit computed by Plaskett and Harper (*Astrophysical Journal*, **30**, 376, 1909) leads to the following residuals: −2.0; +12.4; +8.2; +3.1; −6.5 km/sec. The secondary disturbance discovered by Plaskett and Harper was here disregarded.

155. All plates were given equal weight.

158. Probably S.B.

159. S.B., *Y.O.* Orbit not known.

160. S.B., *L.O.* Orbit not known. The *Ca* velocity depends on one plate only.

161. S.B., *L.O.* Orbit not known.

164. S.B., *Y.O.* Harper's orbit (*R.A.S.C.*, **5**, 16, 1911) gives the following residuals: +2.9; −0.4; −1.3; +0.1; −1.3; −6.2; −4.8; +1.8 km/sec. The *Ca* lines in this star share the periodic oscillations of the other lines. Their velocity, based on the average of only two plates, is placed in parentheses in Table II.

165. Probably S.B.

166. S.B., *Y.O.* Orbit not known.

168. Probably S.B. Double lines were suspected on one plate.

170. S.B., *L.O.* Orbit not known.

171. The *Ca* velocity is based on one plate only.

172. S.B., *Y.O.* Orbit not known.

173. Probably S.B. The measures are difficult because of the existence of bright hydrogen lines. On January 17, 1908, the K line appeared double, giving velocities of −3.3 and +89.9 km/sec. These velocities were not included in Table II.

174. S.B., *L.O.* The orbit is variable according to Henroteau. Simple averages were taken for Table II. All plates were given equal weight.

175. S.B., *Y.O.* Harper (*D.O.*, **4**, 279, 1919) found that the period of this star is 9.6 years. This value satisfies our observations, although the residuals are very large. The average value of O.−C. for each year is as follows:

	km/sec.
1903	−17.1
1906	−12.0
1908	+ 4.0
1909	− 5.0
1910	−27.6

This would place γ at +27.0 km/sec., instead of at +38.5 km/sec., as found by Harper. It seems probable that there exists also a variation of shorter period. This was also suspected by Harper. The line K does not participate in the oscillations, a case rather striking for a B5 star. In taking the mean for our *Ca* velocities one plate (January 1, 1909) was excluded.

177. S.B., *Y.O.* Orbit not known. The hydrogen lines are double, bright, with strong absorption between.

178. The hydrogen lines show two bright components of small intensity. The red component is stronger than the violet one.
179. The hydrogen lines resemble those of star No. 178. The average velocity of β Monocerotis is +21.7 km/sec.
180. S.B., *Y.O.* Orbit not known.
182. Formerly classified as Ao.
184. S.B., *Y.O.* Orbit not known. All plates were given the same weight.
185. S.B., *Y.O.* Orbit not known.
188. S.B., *L.O.* Orbit not known.
193. S.B., *Y.O.* Orbit not known. All plates were given equal weight. The probable error of the average velocity is so small (±0.6 km/sec.) that the variation must be considered as doubtful.
195. S.B., *L.O.* By a strange coincidence ten plates of this star obtained at the Lick Observatory and communicated to us by Dr. J. H. Moore are all clustered near the maximum of the velocity curve, while the three early Yerkes plates fall at or near minimum velocity (+35 km/sec.). Numerous additional plates obtained here during the winter of 1925–1926 and not included in Table III indicate that the period is about 80 days, while K is roughly 40 km/sec. and γ is probably about +80.0 km/sec., as given in Table II. The average from the three early plates, +35.7 km/sec., was used in our determination of the sun's motion.
196. S.B., *L.O.* Orbit not known. The velocity obtained from the bright lines alone is +26.9 km/sec.
197. S.B., *Y.O.* Harper's orbit (*D.O.*, **4**, 123, 1917) gives the following residuals: +28; −8; −56; +7 km/sec. This would make $\gamma = -19.3 \pm 10.5$ km/sec., instead of −12.1 km/sec., as determined by Harper.
198. S.B., *Y.O.* Orbit not known.
201. S.B., *Y.O.* Orbit not known. According to Merrill the $H\alpha$ line is bright in this star (*Det.O.*, **2**, 181, 1916; *Astrophysical Journal*, **61**, 404, 1925). Two of our plates show distinctly a bright line at $H\beta$ superposed over wide absorption.
203. The large range may be due to the poor character of the lines.
204. S.B., *Y.O.* Orbit not known. The lines are double on two plates.
205. S.B., *Y.O.* Orbit not known. All plates were given equal weight.
208. S.B., *Y.O.* The orbit was determined by Ichinohe (*Astrophysical Journal*, **25**, 315, 1907). Systematic corrections bring γ down to +24.1 km/sec. The *Ca* lines share the oscillations of the other lines. The last two plates indicate that Ichinohe's period needs a slight correction. These plates were not used for correcting γ. Assuming that the error in the value of P does not accumulate to more than one-half of its value in the course of 1089 revolutions, the corrected value for P would be 6.395409 days. The two observations of 1923 both fall upon the steep branch of the velocity curve, at phase 4.6 and 5.2 of Ichinohe's velocity-curve (*op. cit.*, p. 319).
213. S.B., *Y.O.* Orbit not known. The *Ca* velocity is based on one plate only.
214. The *Ca* velocity is based on one plate only.
217. Probably S.B. The measures from different lines are discordant.
218. This star was suspected to have a variable radial velocity by W. W. Campbell at the Lick Observatory (*L.O.B.*, **5**, 174, 1909). Later it was removed from the list of spectroscopic binaries on account of errors in two of the velocities (*L.O.B.*, **6**, iv, 1910). Extensive observations of the star were made by Harper (*D.O.*, **1**, 337, 1914) and by Dawson (*Det.O.*, **2**, 158, 1916). The velocities grouped by years show a decided change of long period. In this respect the star is undoubtedly similar to such binaries as ν Geminorum (P=9.6 years) and 37

ϕ^1 Orionis ($P=8.4$ years). This is also confirmed by recent observations from the Detroit Observatory (D. W. Lee, *Popular Astronomy*, **33**, 292, 1925). The stationary *Ca* lines apparently change together with the other lines, but the velocity of the system, as derived from the *Ca* lines, is about 30 km/sec. smaller than that of the other lines.

VELOCITIES OF 47 ρ LEONIS

Year	V	Observatory	Remarks
1902	+35.3	Lick	
1903	34.2	Yerkes	
1903	36.8	Lick	
1904	39.1	Yerkes	
1904	40.5	Lick	
1906	37.	Lick	Probably uncertain
1908	41.1	Lick	
1909	38.0	Yerkes	
1910, 1911, 1912	43.2	Ottawa	
1913, 1914	41.1	Detroit	
1921	33.2	Yerkes	
1923	+57.2	Detroit	

219. S.B., *Mt.W.* Orbit not known.

222. S.B., *Mt.W.* Cannon's orbit (*D.O.*, **4**, 125, 1917) satisfies our observations in general, although the residuals are large: +24.4; −29.5; +34.4; +13.3 km/sec. This is not surprising since the lines are poor.

223. S.B., *L.O.* Orbit not known. All plates were given equal weight.

224. S.B., *Det.O.* Baker's orbit does not satisfactorily represent our observations. This may in part be due to errors of measurement which are exceptionally large because of the presence of variable hydrogen emission lines. Table II gives the average of all velocities. All plates were given equal weight.

226. S.B., Potsdam. A representation of our observations by means of Baker's orbit (*A.O.*, **1**, 67, 1909) leads to large residuals, although in general Baker's orbit seems to be correct. The last plate is well represented. Since both components are visible, the average of the two will differ only slightly from γ. Table II contains the average of the values thus obtained.

227. S.B., *Det.O.* Orbit not known. All plates were given equal weight. The *Ca* velocity depends on one plate only.

230. S.B., *Y.O.* Orbit not known. All plates were given equal weight.

231. S.B., *Mt.W.* Orbit not known. On March 15, 1912, the lines are definitely double. On several other plates duplicities were suspected chiefly in the *Mg* line λ 4481. The value in Table II is placed in parentheses.

233. The measures are very uncertain.

235. The plate of May 10, 1904, evidently does not belong to this star and was excluded in forming the average for Table II.

237. S.B., *D.A.O.* The orbit of this star was determined by J. S. Plaskett from the measurements of the two components (*D.A.O.*, **3**, 179, 1925). Our plate shows single lines, and the velocity is approximately that of the center of mass.

238. S.B., *Mt.W.* Formerly classified as B9. Only one plate.

239. S.B., *A.O.* Jordan's orbit (*A.O.*, **3**, 153, 1915) leads to the following residuals: +19.5; −0.6; +21.2 km/sec. This gives a correction of +13.4 km/sec. to the γ-value derived by Jordan.

241. S.B., Harvard. Orbit not known. All plates were given equal weight.

242. S.B., *Y.O.* Orbit not known. All plates were given equal weight.

244. S.B., *Y.O.* The orbit by Daniel and Schlesinger (*A.O.*, **2**, 135, 1912) gives the following residuals: +27.8; +10.3; +4.0; +4.0 km/sec. These residuals require a correction of +11.5 km/sec. to γ. The probable error of this correction is large, but the fact that all four values are positive is surprising.

247. S.B., *Low.O.* Orbit not known.

249. S.B., *Low.O.* Henroteau finds that the elements of both the short-period oscillation and the long-period oscillation are variable (*D.O.*, **5**, 303, 1921; **8**, 45, 1922; **9**, 91, 1925). Therefore it was thought best to give the mean velocity from all our plates in Table II.

250. S.B., Vienna. Orbit not known. The *Ca* lines show a decided variation while the other lines are probably blended on our plates.

255. The measures are uncertain.

258. S.B., *Y.O.* Baker's orbit (*A.O.*, **1**, 77, 1909) leads to the following residuals: +23; −8; +21; +22; −11; +9 km/sec. The fainter component was measurable on only one of our plates.

259. S.B., *D.O.* The mean velocity from our four plates is given in Table II.

260. S.B., *Y.O.* Orbit not known. Double lines were measured on several plates.

263. S.B., *Y.O.* Orbit not known.

265. S.B., *Y.O.* Orbit not known. This star was under investigation by S. A. Mitchell (*Science*, **34**, 529, 1911). Therefore, only ten plates were measured by Struve for establishing the velocity of the system. No attempt was made to measure separately the components observed by Mitchell in the spectrum of this star.

266. S.B., *L.O.* Orbit not known. All plates were given equal weight.

267. S.B., *Y.O.* The orbit of this star was determined on the basis of the Yerkes plates first by Ichinohe (*Astrophysical Journal*, **26**, 161, 1907) and more recently by Kohl (*A.N.*, **219**, 213, 1923). Systematic corrections fix γ at −7.4 km/sec. for the material used in the determinations of the orbit. More recent series of spectrograms obtained in 1923, 1924, and 1925 by Barrett and Struve, and investigated by Kohl, indicate that γ is variable with a period of several years. This explains also the divergence of the early Lick observations, referred to by Ichinohe and by Kohl.

268. S.B., *Y.O.* Orbit not known. Double lines were measured on one plate. The *Ca* velocity is uncertain.

271. S.B., *Y.O.* Orbit not known.

273. S.B., *L.O.* Orbit under investigation by F. W. Meyer at the Lick Observatory. (*Pub. A.S.P.*, **38**, 133, 1926). This star was independently suspected to be a S.B. from our observations. At the request of Mr. Meyer the six plates were remeasured by Struve with the following results: −30.0; −24.5; −5.8; −9.6; +0.2; −2.4 km/sec. The first measure of April 28, 1913, as given in Table III is −18.7 km/sec. This value is reduced to −31.9 km/sec., if one very doubtful line (*Ca* K) is excluded.

275. The *Ca* velocity is uncertain.

276. S.B., *Y.O.* The orbit of this star was determined by Jordan (*A.O.*, **3**, 119, 1914), who finds that the period which best represents the Allegheny observations does not fit the Yerkes velocities as well as a longer one. For this reason we give the average of our plates in Table II.

281. S.B., *Y.O.* Jordan's orbit (*A.O.*, **3**, 77, 1914) gives the following residuals: −4; −5; +7; +16 km/sec. The corresponding correction to γ is +3.5 km/sec.

285. S.B., *L.O.* Orbit not known. All plates were given equal weight.

288. S.B., *L.O.* Wilson's orbit gives the following residuals (*L.O.B.*, **8**, 132, 1914): −11.0; −5.4; −3.9; −0.5; +9.1; −4.7; −1.1; −4.3; −9.1; −5.1; −0.1; +0.5; −12.2; −9.6; −10.9;

−2.2; −14.8; −3.2; −11.3; −6.1; −5.4; +1.9; −2.6; −2.7 km/sec. The corresponding correction to γ is −5.2 km/sec. The *Ca* lines share the oscillations of the other lines.

293. Probably S.B.

294. S.B., *L.O.* Orbit not known.

295. S.B., *Mt.W.* The orbit of this star was determined by Jordan (*A.O.*, **3**, 189, 1916). Our first three plates are of poor quality, and the two spectral components are not distinctly visible. Jordan's period fits our observations but the residuals are large, because the lines were measured as single except on the last plate. The residuals are −38.1; +18.7; −76.7; +19.2 km/sec. The value given in Table II is uncertain.

299. Probably S.B. The *Mg* line at λ 4481 is double on several plates.

302. The *Ca* velocity is uncertain.

304. S.B., *Det.O.* The orbit is not known. The measures are difficult because of the presence of bright hydrogen lines.

305. S.B., *Y.O.* Orbit not known.

309. S.B., *L.O.* Orbit not known. All plates were given equal weight.

315. S.B., *D.O.* Orbit not known.

317. S.B., *Y.O.* Baker's orbit (*A.O.*, **2**, 35, 1910) gives the following residuals: −4.7; +21.0; −9.4; −4.7 km/sec. The correction to γ is +0.6 km/sec.

320. S.B., *Det.O.* Orbit not known.

323. The velocities obtained from the hydrogen emission lines are given under "Remarks."

324. S.B., *Det.O.* (*Popular Astronomy*, **29**, 30, 1921). Orbit not known.

325. S.B., Vienna. Orbit not known.

328. S.B., *Y.O.* A preliminary orbit was determined by Frost (*Astrophysical Journal*, **24**, 259, 1906). Other investigations were made by Crump (*Det.O.*, **2**, 144, 1915), by Gerasimovič (*Bulletin de l'Obs. Central de Russie, Pulkovo*, **7**, No. 80), by Belopolsky (*Bulletin de l'Académie des Sciences de Russie*, 1918), and by Henroteau (*D.O.*, **9**, 36, 1925). The Yerkes Observatory has a large collection of spectrograms of this star, which will soon be discussed. In the present paper only those observations are given which were used in Frost's orbit for 1906. A comparison of the γ-velocities obtained at different observatories proves beyond doubt that γ varies with a period of about eighteen years (see also Belopolsky, *op. cit.*). All available values of γ are given in the table below. The corresponding quantities for Ottawa were estimated from the curves given by Henroteau. They are probably about as accurate as the other values.

Year	γ	Authority
1906.....	− 7.3	Frost; Yerkes
1912.....	12.	Frost; Yerkes
1912.....	13.	Crump; Detroit
1914.....	26.	Gerasimovič; Pulkovo
1916.....	32.	Belopolsky; Pulkovo
1917.....	22.	Belopolsky; Pulkovo
1922.....	14.	Henroteau; Ottawa
1923.....	− 8.	Henroteau; Ottawa

Table II contains the γ-value for 1906 corrected for systematic errors. It is placed in parentheses since the velocity of the long-period system is probably around −20 km/sec.

329. S.B., *Low.O.* Orbit not known. Only one plate.

331. S.B., *Det.O.* Plaskett's orbit (*D.A.O.*, **2**, 273, 1923) gives O.−C. = +30.8 km/sec. The plate is of poor quality, which may account for the large residual. The velocity obtained from our plate is placed in parentheses in Table II.

332. S.B., *L.O.* Orbit not known.
333. S.B., *L.O.* Orbit not known. All plates were given equal weight.
334. Probably S.B.
335. S.B., *Y.O.* Orbit not known.
336. Probably S.B.
338. S.B., *Y.O.* Orbit not known. Two spectra.
339. S.B., *Det.O.* Orbit not known.
343. S.B., *L.O.* Orbit not known. (*Pub. A.S.P.*, **38**, 132, 1926).
346. S.B., *Y.O.* Baker's orbit (*A.O.*, **1**, 93, 1909) gives for the first plate a residual of -3.0 km/sec. On the three remaining plates the two components are blended. The most probable value of γ, as derived from our plates, is -7.0 km/sec.
349. S.B., *Y.O.* Orbit not known.
351. S.B., *Mt.W.* Orbit not known. The range is probably large. The *Ca* velocity is uncertain.
352. S.B., *Y.O.* Orbit not known. The velocities given in Table III differ slightly from those adopted by Frost and Lowater in their investigation on the spectrum of 10 Lacertae (*Astrophysical Journal*, **40**, 268, 1914), but the average velocity in Table II is probably very close to the velocity of the system of this binary.
354. S.B., *Mt.W.* Investigations by Young show that the velocity curve is variable. Table II gives the average from our three plates. No representation by means of Young's elements has been attempted.
355. S.B., *Y.O.* The orbit of this star was determined by Struve and Bobrovnikoff (*Astrophysical Journal*, **62**, 139, 1925). Systematic errors require a correction of -0.2 km/sec. to γ.
356. S.B., *Y.O.* Orbit not known.
357. S.B., *L.O.* Orbit not known.
359. S.B., *Y.O.* Orbit not known.
361. Probably S.B.
363. S.B., *Y.O.* The accuracy of our measurements of this star is not great. The residuals from Baker's orbit (*A.O.*, **2**, 25, 1910) were roughly estimated as -5; $+1$; -10; $+8$ km/sec. The corresponding correction to γ is -1.5 km/sec.
364. S.B., *Y.O.* Orbit not known. Duplicities were suspected on several plates.

Table III contains the velocities as obtained separately from all plates. The various columns give: the current number of the star; the dispersion; the date of observation in Greenwich Mean Time up to January 1, 1925, and thereafter in Greenwich Civil Time, now known as Universal Time. Then follow: the velocity of the star and the velocity from the calcium lines only, in km/sec.; the quality of the plate; and the name of the measurer. Separate values from double lines as well as from emission lines, when discordant, are given under "Remarks."

Since some of the 2431 plates were measured more than once the total number of measures used in this paper is 2710.

OBSERVERS AND MEASURERS

The names of the observers at the telescope and of the measurers are listed below, together with the number of these plates taken or measured by them:

Name	Abbreviation	Number of Plates	
		Taken	Measured
W. S. Adams	A	321	372
E. C. Arbogast	Ar	3	86
S. B. Barrett	.....	737	.....
Dorothy W. Block	Bk	22	25
N. T. Bobrovnikoff	Bf	.....	1
J. W. Campbell	Ca	.....	9
C. C. Crump	C	25	17
Helen N. Davis	D	.....	7
P. Fox	.....	20	.....
E. B. Frost	F	540	257
Florence A. Graves	Gr	.....	6
D. V. Guthrie	G	.....	7
Florence E. Harpham	H	.....	23
E. P. Hubble	.....	8	.....
N. Ichinohe	I	3	76
F. C. Jordan	J	.....	2
J. Lemkowitz	Lz	.....	18
O. J. Lee	L	244	533
Frances Lowater	Lo	.....	19
C. A. Maney	.....	21	.....
S. A. Mitchell	Mi	.....	9
G. S. Monk	M	85	24
J. Paraskévopoulos	.....	16	.....
J. A. Parkhurst	.....	6	.....
O. Struve	S	285	1176
F. R. Sullivan	.....	31	.....
Evelyn W. Wickham	W	64	45

Mr. F. R. Sullivan assisted in securing most of the plates at the telescope and shared in the guiding on nearly all of them.

TABLE III

VELOCITIES FROM SEPARATE PLATES

No.	Pis.	Date	G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
1	I	1915 Oct.	25.583	+ 10.3	+ 9.3	f	S	
1	I	1924 Dec.	1.664	+ 2.4	− 22.1	f	S	
1	I	1924 Dec.	13.671	− 6.8	− 2.4	g	S	
2	I	1924 Oct.	26.655	+ 2.6	.....	g	S	
2	I	1924 Nov.	9.660	+ 26.6	.....	f	S	
2	I	1924 Dec.	24.595	+ 14.6	.....	g	S	
3	III	1901 Sep.	5.894	+ 2.9	.....	g	A	
3	III	1901 Sep.	6.713	+ 5.8	.....	g	A	
3	III	1901 Sep.	18.618	+ 2.7	.....	g	F, A	
3	III	1901 Sep.	26.587	+ 3.9	.....	f	A	
3	III	1901 Oct.	16.532	+ 6.3	.....	g	F	
3	III	1901 Nov.	27.508	+ 6.6	.....	g	Gr, F, A	
3	III	1902 Aug.	22.861	+ 6.6	.....	g	Gr, F, A	
3	III	1902 Oct.	9.745	+ 6.9	.....	g	F, A	
3	I	1902 Dec.	3.575	− 3.1	.....	f	A, F	
3	III	1903 Oct.	9.801	+ 5.8	.....	g	F, Gr	
3	III	1904 July	1.868	+ 9.9	.....	g	Gr	
4	I	1917 Sep.	28.700	+ 4.5	− 7.7	f	S	
4	I	1917 Oct.	26.606	+ 10.0	.....	g	S	
4	I	1917 Nov.	5.578	+ 17.7	+ 0.1	g	S	
4	I	1917 Dec.	10.505	− 29.5	− 19.1	f	S	
5	I	1906 Oct.	22.667	− 5.0	.....	vp	Ar	
5	I	1908 Aug.	24.598	− 15.3	.....	vp	Ar	
5	I	1910 Sep.	30.511	− 26.0	.....	vp	Ar	
5	I	1917 Nov.	9.715	− 45.6	.....	p	S	
5	I	1917 Nov.	23.573	+ 14.9	.....	g	S	
5	I	1917 Dec.	3.508	− 19.7	.....	f	S	
5	I	1917 Dec.	14.476	− 1.7	.....	f	S	
6	I	1908 Sep.	7.684	− 4.1	.....	g	L	
6	I	1908 Sep.	8.632	− 7.4	− 17.4	g	L, S	
6	I	1908 Oct.	5.630	+ 0.7	.....	g	L, S	
6	I	1910 Aug.	8.776	− 18.4	.....	f	L	
6	I	1910 Aug.	12.824	− 14.5	.....	g	L	
7	I	1904 Nov.	11.658	− 0.5	.....	g	L	
7	I	1904 Nov.	15.656	− 6.5	− 5.0	g	L	
7	I	1904 Nov.	22.662	− 9.2	.....	g	L	
7	I	1915 Aug.	27.765	− 3.9	.....	g	S	
7	I	1915 Sep.	13.690	− 6.4	.....	g	S	
7	I	1915 Oct.	11.652	+ 0.7	.....	f	S	
7	I	1915 Nov.	5.606	+ 7.2	.....	f	S	
8	III	1901 Oct.	31.576	+ 1.4	.....	g	S, F	
8	III	1901 Nov.	7.613	+ 3.9	.....	g	A	
8	III	1901 Nov.	27.700	+ 3.2	.....	g	F, A	
8	III	1902 July	22.799	+ 3.2	.....	g	A, F, S	
8	I	1904 July	26.851	+ 1.2	.....	f	S	
8	I	1907 Oct.	7.921	+ 1.3	.....	g	G	
8	I	1910 Aug.	25.778	+ 0.1	− 13.3	g	L	
9	I	1903 Sep.	25.730	− 3.7	.....	g	F, A	
9	I	1903 Oct.	10.588	+ 32.4	.....	g	F, A	
9	I	1903 Oct.	17.812	+ 59.9	.....	g	F, A	
9	I	1907 Sep.	23.796	+ 65.5	.....	g	L	
9	I	1907 Sep.	24.770	+ 66.8	.....	g	L	
9	I	1907 Oct.	11.778	+ 25.3	.....	g	L	
9	I	1907 Oct.	22.653	+ 12.4	.....	g	L	
10	I	1903 Oct.	10.618	− 4.6	.....	f	F, A	

TABLE III—*Continued*

No.	Dis.	Date G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
10	I	1903 Oct. 24.732	− 34.4	.....	g	F, A	
10	I	1903 Oct. 31.725	− 26.5	.....	g	F, A	
10	I	1903 Nov. 7.608	− 10.8	.....	g	F, A	
10	I	1923 June 4.884	+ 8.6	.....	f	S	
10	I	1923 Nov. 17.572	− 17.4	− 4.0	f	S	
10	I	1923 Dec. 2.472	− 0.5	.....	f	S	
10	I	1923 Dec. 8.581	− 6.7	− 51.4	g	S	
10	I	1923 Dec. 14.464	+ 1.7	− 16.6	g	S	
10	I	1923 Dec. 14.496	− 15.1	− 10.3	f	S	
10	I	1923 Dec. 15.465	− 3.4	− 9.9	g	S	
10	I	1923 Dec. 15.494	− 4.4	− 9.7	f	S	
10	I	1923 Dec. 16.465	− 8.5	− 12.6	g	S	
10	I	1923 Dec. 16.490	+ 4.5	.....	f	S	
10	I	1923 Dec. 25.480	− 6.8	− 7.8	g	S	
10	I	1923 Dec. 25.511	− 21.4	.....	f	S	
10	I	1924 Jan. 5.613	− 14.1	.....	p	S	
11	I	1904 Nov. 11.712	− 67.1	.....	g	L	
11	I	1907 Sep. 24.816	− 57.1	.....	g	L	
11	I	1908 Aug. 28.769	− 37.7	.....	g	L	
12	I	1905 Aug. 7.867	− 15.6	.....	p	Ar	
12	I	1908 Aug. 28.823	− 4.6	.....	p	Ar	
12	I	1908 Dec. 11.486	− 9.9	.....	p	Ar	
12	I	1911 Aug. 28.830	− 2.3	+ 11.8	f	Ar, S	
12	I	1911 Sep. 10.788	− 12.6	.....	p	S	
13	I	1918 Oct. 18.790	− 21.8	− 18.5	g	S	
13	I	1919 Sep. 1.706	− 3.1	− 7.5	g	S	
13	I	1919 Sep. 26.660	+ 23.9	.....	f	S	
13	I	1920 Jan. 16.651	+ 4.5	− 15.0	g	S	
14	I	1914 Dec. 21.488	+ 9.9	.....	f	S	
14	I	1916 Jan. 7.488	− 4.7	.....	g	S	
14	I	1916 Jan. 7.542	+ 14.5	.....	g	S	
14	I	1916 Jan. 10.492	− 2.5	.....	p	S	
14	I	1916 Jan. 10.528	− 16.2	.....	f	S	
14	I	1916 Jan. 14.493	− 0.1	.....	f	S	
14	I	1916 Jan. 14.517	+ 6.3	.....	f	S	
15	I	1903 Oct. 30.618	+ 0.7	.....	g	S	+ 18.0
15	I	1904 Nov. 18.708	− 16.9	.....	p	S	
15	I	1904 Nov. 18.713	− 0.2	.....	p	S	
15	I	1918 July 1.889	− 21.8	.....	g	S	+ 13.6
15	I	1918 July 1.903	− 18.1	.....	g	S	
15	I	1918 July 22.901	− 32.5	.....	f	S	
15	I	1918 Oct. 28.603	− 11.7	.....	g	S	− 6.1
15	I	1920 Jan. 16.575	− 14.5	.....	g	S	
16	I	1904 Nov. 15.710	− 28.5	.....	g	L	
16	I	1904 Nov. 18.670	− 6.5	.....	g	L	
16	I	1910 July 29.872	+ 62.5	.....	g	L	
16	I	1910 Oct. 10.684	− 14.5	.....	g	L	
17	I	1905 Dec. 15.579	+ 12.9	.....	g	S	
17	I	1905 Dec. 25.518	− 1.9	.....	g	S	
18	I	1917 Nov. 16.556	+ 10.1	+ 9.0	g	S	
18	I	1921 Oct. 21.623	+ 6.0	+ 0.6	f	S	
18	I	1924 July 26.868	+ 39.1	.....	p	S	
18	I	1924 July 28.873	+ 10.0	.....	vp	S	
19	I	1908 Sep. 21.753	− 0.7	.....	p	Ar	
19	I	1910 Jan. 7.485	− 2.1	.....	vp	Ar	

TABLE III—*Continued*

No.	Dis.	Date G.M.T.	V	V_{Co}	Qual.	Meas.	Remarks
19	I	1920 Oct. 15.689	+ 17.2	+ 8.7	f	S	
20	I	1924 Nov. 19.764	− 6.0	− 19.6	g	S	
20	I	1924 Dec. 27.590	− 21.0	− 28.8	f	S	
20	I	1925 Jan. 6.056	− 12.4	− 32.2	f	S	
21	I	1917 Sep. 21.719	+ 8.3	+ 0.7	g	S	
21	I	1919 Sep. 22.698	− 2.9	.....	g	S	
21	I	1920 Dec. 24.643	− 30.0	.....	f	S	
22	I	1915 Sep. 6.808	− 9.2	.....	p	S	
23	I	1915 Sep. 13.887	+ 0.5	.....	p	S	
23	I	1924 Dec. 9.712	− 3.8	− 12.2	g	S	
23	I	1925 Jan. 7.103	− 13.8	− 25.0	g	S	
24	I	1908 Nov. 10.769	− 25.8	.....	f	S	
25	I	1913 Sep. 5.797	(+ 87.8)	.....	f	S	+ 14.1, +161.6
26	III	1901 Oct. 3.719	− 3.7	.....	f	A	
26	III	1901 Oct. 23.858	− 5.8	.....	f	A	
26	III	1901 Oct. 25.589	− 5.0	.....	g	A	
26	III	1902 Aug. 27.784	− 3.6	.....	g	A	
26	I	1908 Jan. 24.631	− 6.4	.....	f	G	
27	I	1909 Sep. 20.781	− 34.9	.....	p	L	
27	I	1911 Aug. 18.842	− 27.6	.....	g	L	
27	I	1911 Nov. 20.506	− 8.7	.....	p	L	
27	I	1911 Nov. 25.576	− 1.8	+ 3.7	g	L	
27	I	1914 Dec. 25.507	+ 19.8	.....	p	C	
27	I	1915 Aug. 27.819	− 36.5	.....	f	C	
27	I	1915 Oct. 1.776	+ 17.2	.....	f	C	
28	I	1903 Nov. 7.653	− 25.8	.....	g	A, F	
28	I	1903 Nov. 17.539	− 19.6	.....	p	F, A	
28	I	1903 Dec. 1.572	− 11.8	.....	g	F, A	
28	I	1904 Jan. 23.615	+ 9.2	.....	g	F, A	
28	I	1907 Sep. 21.864	− 6.7	.....	g	L	
28	I	1907 Sep. 24.866	− 16.2	.....	g	L	
28	I	1907 Dec. 11.491	− 0.2	.....	g	L	
28	I	1907 Dec. 16.538	+ 1.2	.....	g	L	
28	I	1908 Jan. 14.701	+ 2.4	.....	g	L	
29	I	1916 Oct. 13.749	+ 2.3	.....	f	S	−104.3, +108.9
29	I	1916 Oct. 16.767	+ 8.7	.....	f	S	− 67.1, + 85.3
29	I	1916 Nov. 4.687	+ 31.1	− 41.2	f	S	Single
29	I	1916 Nov. 16.635	+ 14.0	.....	g	S	−101.8, +129.9
29	I	1916 Nov. 29.590	+ 9.6	.....	p	S	− 95.6, +114.8
29	I	1916 Dec. 18.551	− 11.7	.....	f	S	Single
30	III	1902 Aug. 7.906	+ 8.8	.....	g	S	
30	III	1902 Aug. 11.892	+ 6.4	.....	g	S	
30	III	1902 Sep. 3.832	+ 14.2	.....	g	S	
30	III	1902 Oct. 29.670	+ 8.0	.....	g	S	
30	I	1915 Dec. 7.506	+ 9.0	.....	vp	S	
30	I	1916 July 7.903	− 18.1	.....	vp	S	
30	I	1916 Aug. 27.888	+ 9.0	.....	vp	S	
30	I	1917 Aug. 9.907	+ 6.3	.....	p	S	
30	I	1917 Aug. 10.922	+ 12.0	.....	g	S	
30	I	1917 Aug. 17.897	+ 12.5	.....	f	S	
30	I	1917 Aug. 24.894	+ 7.0	.....	g	S	
30	I	1917 Aug. 31.907	+ 9.0	.....	p	S	
30	I	1917 Sep. 24.744	− 2.3	.....	f	S	
30	I	1918 Jan. 4.536	+ 23.5	.....	g	S	
30	I	1918 Jan. 28.498	+ 7.9	.....	g	S	

TABLE III—*Continued*

No.	Dis.	Date	G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
30	I	1922 Oct.	30.726	+ 12.0	.....	g	S	
30	I	1922 Oct.	30.756	+ 16.5	.....	g	S	
30	I	1922 Oct.	30.785	+ 8.2	.....	g	S	
30	I	1922 Oct.	30.817	+ 14.7	.....	g	S	
30	I	1922 Oct.	30.842	+ 15.0	.....	g	S	
30	I	1922 Oct.	30.867	+ 16.1	.....	g	S	
31	I	1904 Dec.	20.528	+ 9.1	.....	f	Ar	
31	I	1909 Oct.	25.723	+ 1.3	.....	f	Ar	
31	I	1919 Oct.	17.665	+ 8.6	− 48.2	f	S	
32	I	1925 Jan.	6.154	+ 2.0	.....	g	S	
32	I	1925 Jan.	19.111	− 10.3	.....	f	S	
32	I	1925 Jan.	20.999	− 9.9	.....	g	S	
33	I	1915 Oct.	22.710	+ 18.2	.....	g	S	
33	I	1915 Dec.	13.553	+ 15.6	.....	f	S	
33	I	1916 Dec.	29.533	+ 17.3	.....	f	S	
34	I	1915 Jan.	4.509	− 6.0	.....	f	S	
34	I	1915 Sep.	20.818	+ 19.3	+ 19.0	f	S	
34	I	1918 Nov.	1.680	+ 24.8	+ 29.3	g	S	
34	I	1918 Nov.	8.697	+ 33.8	+ 14.8	g	S	
34	I	1919 Dec.	19.705	+ 18.8	.....	f	S	
35	I	1915 Jan.	4.890	− 10.3	.....	g	S	
35	I	1915 Sep.	13.881	+ 40.5	.....	f	S	
35	I	1915 Nov.	8.651	+ 8.8	.....	f	S	
35	I	1915 Dec.	13.582	+ 9.0	.....	f	S	
35	I	1915 Dec.	27.512	− 14.5	.....	g	S	
35	I	1918 July	22.865	+ 50.2	.....	p	S	
35	I	1918 July	26.878	+ 15.2	.....	f	S	
35	I	1918 Aug.	26.914	− 1.3	.....	g	S	
35	I	1921 Oct.	7.735	+ 20.1	.....	p	S	
36	I	1924 Nov.	15.653	+ 6.6	.....	g	S	
36	I	1924 Nov.	30.620	+ 1.6	.....	g	S	
36	I	1925 Jan.	6.207	+ 6.6	.....	g	S	
37	I	1904 Nov.	1.785	+ 13.6	.....	g	S, L	
37	I	1904 Nov.	15.771	− 20.0	.....	f	S, L	
37	III	1905 Nov.	3.777	− 7.6	.....	g	L	
37	I	1913 Nov.	3.648	+ 9.6	.....	f	S	
38	I	1910 Jan.	3.580	+ 5.9	.....	vp	Ar	
38	I	1910 Nov.	7.692	+ 10.8	.....	vp	Ar	
38	I	1910 Dec.	12.612	+ 10.8	.....	vp	Ar	
39	I	1921 Oct.	7.842	− 9.6	.....	g	S	
39	I	1923 Sep.	8.899	− 14.4	.....	p	S	
39	I	1923 Oct.	22.797	+ 1.3	− 3.0	g	S	
40	III	1902 Sep.	7.742	+ 18.5	.....	f	S	
40	III	1902 Oct.	9.842	+ 53.2	.....	f	S	
40	III	1902 Nov.	6.606	− 16.7	.....	f	S	
41	I	1915 Oct.	25.681	+ 11.5	.....	f	S	
41	I	1919 Sep.	1.817	+ 5.0	.....	f	S	
41	I	1919 Sep.	22.830	− 1.6	.....	f	S	
41	I	1919 Oct.	20.757	+ 2.5	.....	f	S	
42	I	1903 Nov.	17.595	− 0.9	.....	g	S	
42	I	1906 Oct.	31.719	− 13.0	.....	g	S	
42	I	1907 Oct.	18.786	+ 35.0	.....	g	S	
42	I	1908 Jan.	24.679	− 10.4	− 4.4	g	S	
43	I	1904 Nov.	11.776	− 3.7	.....	g	S, L	
43	I	1909 Oct.	29.712	− 29.4	.....	p	S, L	

TABLE III—*Continued*

No.	Dis.	Date G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
43	I	1909 Nov. 26.778	− 8.6	.....	f	S, L	
43	I	1913 Nov. 3.716	− 12.3	.....	g	S, C	
44	I	1914 Dec. 25.553	+ 33.9	.....	f	S	
44	I	1915 Oct. 4.793	+ 37.7	:.....	f	S	
44	I	1915 Oct. 29.712	+ 32.1	.....	vp	S	
45	I	1904 Jan. 2.520	+ 10.1	.....	g	F	
45	I	1904 Nov. 11.836	+ 7.4	.....	g	L	
45	I	1904 Dec. 30.514	+ 4.0	.....	g	L	
46	I	1904 Nov. 1.870	+ 3.0	.....	g	L	
46	I	1906 Oct. 12.710	− 0.6	.....	g	L	
46	I	1910 Dec. 26.575	+ 6.3	.....	g	L	
47	I	1914 Dec. 25.621	+ 32.1	.....	g	S	
47	I	1915 Aug. 27.919	− 6.5	− 10.7	g	S	
47	I	1915 Aug. 30.883	− 3.8	.....	f	S	
48	I	1903 Sep. 18.833	− 4.3	.....	g	A	
48	I	1903 Sep. 26.825	− 5.0	.....	g	A	
48	I	1903 Oct. 10.655	− 5.2	.....	f	A	
48	I	1907 Oct. 22.760	− 12.4	− 2.1	g	L	
48	I	1908 Oct. 5.827	− 3.7	.....	p	L	
48	I	1922 Feb. 10.628	− 5.5	− 6.9	g	S	
49	I	1903 Sep. 5.869	− 5.6	.....	g	A	
49	I	1903 Sep. 18.793	− 1.9	.....	f	A	
49	II	1903 Sep. 19.863	− 6.3	.....	f	A	
49	I	1903 Sep. 26.778	− 0.9	.....	g	A	
49	I	1909 Jan. 1.589	− 22.8	.....	g	L	
49	I	1910 Jan. 18.515	− 11.8	.....	g	Ar	
49	I	1910 Oct. 10.756	− 13.4	− 40.6	g	Ar	
49	I	1910 Oct. 28.783	+ 12.6	.....	p	S, Ar	
50	I	1903 Sep. 5.781	+ 20.9	.....	g	S	
50	I	1910 Dec. 29.580	+ 19.3	.....	g	L	
50	I	1910 Dec. 30.991	+ 8.6	.....	g	L	
50	I	1911 Jan. 6.587	+ 7.2	.....	g	L	
51	I	1914 Nov. 27.639	+ 7.7	.....	g	S	
51	I	1914 Dec. 21.587	+ 6.6	+ 8.0	f	S	
51	I	1915 Dec. 14.617	+ 8.9	+ 6.6	g	S	
52	I	1910 Dec. 16.637	+ 15.4	.....	f	S	
52	I	1914 Nov. 17.659	+ 37.7	.....	p	S	
52	I	1915 Sep. 6.920	+ 50.3	.....	p	S	
53	I	1905 Dec. 15.615	− 5.9	.....	p	S	Single
53	I	1906 Oct. 19.758	− 4.0	.....	g	S	− 94.6, + 86.5
53	I	1906 Nov. 1.747	+ 13.3	.....	g	S	− 60.1, + 86.7
53	I	1906 Nov. 14.740	+ 8.8	.....	p	S	Single
53	I	1906 Dec. 14.688	+ 98.4	.....	vp	S	Single
53	I	1906 Dec. 17.580	+ 26.6	.....	f	S	−60.3, +113.5
53	I	1908 Jan. 28.533	+ 11.2	.....	g	S	Single
53	I	1924 Dec. 24.667	− 2.9	.....	g	S	Single
53	I	1924 Dec. 27.690	− 9.2	.....	f	S	−49.8, + 24.3
53	I	1925 Jan. 6.113	+ 15.3	.....	g	S	Single
53	I	1925 Jan. 8.159	+ 5.2	.....	g	S	− 93.3, +113.8
53	I	1925 Jan. 11.045	− 4.2	.....	f	S	− 69.2, + 60.8
53	I	1925 Jan. 15.063	− 12.8	.....	f	S	− 64.5, + 39.0
53	I	1925 Jan. 18.067	− 1.3	.....	f	S	Single
53	I	1925 Jan. 21.051	− 6.6	.....	g	S	−131.9, +118.8
53	I	1925 Jan. 22.999	+ 2.4	.....	g	S	− 95.5, +100.2
53	I	1925 Jan. 23.103	+ 12.8	.....	p	S	− 55.9, + 81.4

TABLE III—*Continued*

No.	Dis.	Date G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
53	I	1925 Jan. 31.001	+ 44.4	.....	p	S	Single
53	I	1925 Feb. 1.003	+ 11.2	.....	p	S	− 71.4, + 93.7
53	I	1925 Feb. 5.007	− 8.8	.....	f	S	−113.0, + 95.3
53	I	1925 Feb. 12.003	+ 43.9	.....	g	S	Single
53	I	1925 Feb. 15.015	+ 13.1	.....	g	S	− 39.8, + 77.3
53	I	1925 Mar. 2.029	+ 48.3	.....	p	S	− 39.5, +136.1
54	I	1916 Sep. 23.844	+ 13.5	.....	f	S	
54	I	1919 Oct. 6.826	+ 16.4	+ 19.5	g	S	
54	I	1919 Dec. 26.596	+ 20.2	+ 8.3	g	S	
55	I	1905 Sep. 18.806	− 28.5	.....	g	L	
55	I	1907 Nov. 25.659	− 20.8	.....	g	L	
55	I	1910 Dec. 26.630	− 61.0	.....	g	L	
55	I	1910 Dec. 29.615	− 38.9	.....	g	L	
55	I	1912 Dec. 30.601	− 39.7	.....	g	S	
56	I	1903 Dec. 1.611	+ 0.3	.....	g	F	
56	I	1903 Dec. 27.542	+ 3.7	.....	g	F	
56	I	1903 Dec. 31.558	+ 4.0	.....	f	F	
57	I	1917 Jan. 24.522	− 13.2	.....	g	S	
57	I	1924 Sep. 1.892	+ 2.3	.....	p	S	
57	I	1924 Sep. 4.896	− 6.8	.....	p	S	
58	III	1902 Feb. 19.659	+133.5	.....	g	F, A	
58	III	1902 Feb. 21.599	− 77.4	.....	g	A	
58	III	1902 Mar. 4.599	+127.5	.....	g	A	
58	III	1902 Apr. 2.619	−116.5	.....	f	A	
58	III	1902 Apr. 3.619	− 4.8	.....	g	A	
59	I	1917 Dec. 31.515	+ 46.8	.....	f	S	
59	I	1918 Sep. 13.885	+ 51.2	.....	f	S	
59	I	1924 Sep. 29.916	+ 22.9	.....	vp	S	
59	I	1924 Oct. 16.884	+ 56.9	.....	g	S	
60	I	1903 Oct. 10.720	+ 17.2	.....	g	A	
60	I	1903 Oct. 30.734	+ 13.2	.....	g	A	
60	I	1904 Jan. 29.494	+ 13.0	.....	g	A	
61	I	1904 Jan. 23.489	+ 4.7	.....	g	A	
61	I	1904 Mar. 19.638	+ 3.7	.....	g	A	
61	I	1904 Apr. 15.568	+ 2.1	.....	g	A	
62	I	1915 Jan. 8.594	+ 20.4	+ 28.3	f	S	
62	I	1924 Oct. 26.747	− 2.7	+ 10.2	g	S	
63	I	1903 Oct. 30.792	− 7.2	.....	f	A	
63	I	1903 Dec. 25.734	− 20.0	.....	g	A	
63	I	1903 Dec. 27.613	− 5.8	.....	g	A	
63	I	1904 Jan. 2.484	+ 4.0	.....	g	A	
63	III	1904 Jan. 9.493	+ 2.2	.....	g	A	
63	I	1904 Mar. 19.614	+ 6.4	.....	f	A	
63	III	1904 Mar. 25.601	+ 2.6	.....	f	A	
63	I	1922 Oct. 2.760	+ 16.7	+ 11.5	f	S	
63	I	1922 Oct. 2.778	+ 13.9	− 1.6	f	S	
63	I	1922 Oct. 2.795	+ 15.7	.....	f	S	
63	I	1922 Oct. 2.813	+ 12.9	.....	f	S	
63	I	1922 Oct. 2.833	+ 5.9	− 3.6	g	S	
63	I	1922 Oct. 2.852	+ 2.0	+ 5.4	g	S	
64	I	1918 Feb. 4.529	+ 26.2	.....	g	S	
64	I	1924 Nov. 30.709	+ 11.8	.....	g	S	
65	I	1903 Dec. 27.542	+ 6.6	.....	g	A	
65	I	1904 Mar. 19.569	+ 3.4	.....	g	A	
65	I	1904 Apr. 16.561	+ 7.4	.....	f	A	

TABLE III—*Continued*

No.	Dis.	Date	G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
66	I	1903 Oct.	30.697	+ 16.5	.....	g	A	
66	I	1903 Dec.	4.563	+ 13.6	.....	g	A	
66	I	1903 Dec.	25.791	+ 12.7	.....	g	A	
67	I	1915 Oct.	1.852	+ 39.4	+ 45.5	g	S	
67	I	1925 Jan.	18.008	+ 4.7	.....	g	S	
67	I	1925 Jan.	19.008	− 17.4	.....	g	S	
68	I	1905 Dec.	25.605	+ 12.6	.....	g	L	
68	I	1906 Feb.	19.599	+ 14.0	.....	f	L	
68	I	1906 Sep.	17.906	+ 20.3	.....	g	L	
69	I	1903 Oct.	30.658	+ 14.0	.....	g	A	
69	I	1903 Dec.	25.769	+ 11.6	.....	g	A	
69	I	1904 Jan.	29.517	+ 14.6	.....	g	A	
69	I	1904 Feb.	26.518	+ 10.2	.....	g	A	
70	I	1922 Jan.	23.535	+ 28.7	.....	g	S	
70	I	1922 Jan.	27.523	+ 16.3	.....	f	S	
70	I	1922 Feb.	10.672	+ 21.7	.....	f	S	
70	I	1922 Dec.	25.549	+ 17.2	.....	f	S	
70	I	1923 Nov.	10.683	+ 41.7	.....	g	S	
70	I	1924 Aug.	27.881	+ 10.7	.....	f	S	
71	I	1924 Oct.	25.814	+ 0.5	.....	g	S	
71	I	1924 Nov.	2.703	+ 11.1	.....	g	S	
71	I	1924 Nov.	3.758	+ 24.2	.....	g	S	
72	III	1901 Sep.	12.753	+ 20.9	.....	f	A	
72	III	1901 Sep.	18.868	+ 23.7	.....	g	A	
72	III	1901 Nov.	8.690	+ 21.7	.....	f	A, F	
72	III	1901 Nov.	14.840	+ 20.6	.....	g	A, F	
72	III	1902 Oct.	15.697	+ 21.3	.....	g	A	
73	I	1924 Oct.	1.940	+ 10.3	− 16.9	g	S	
73	I	1924 Oct.	5.953	+ 5.9	− 20.6	g	S	
73	I	1924 Oct.	19.791	− 7.3	.....	f	S	
74	I	1921 Oct.	21.785	− 15.5	.....	p	S	
74	I	1924 Sep.	17.778	+ 42.7	.....	f	S	
74	I	1924 Sep.	22.818	+ 10.7	.....	f	S	
75	I	1905 Dec.	15.651	+ 25.6	.....	g	L	
75	I	1905 Dec.	25.649	+ 21.0	+ 16.6	g	L	
75	I	1906 Jan.	26.583	+ 27.8	.....	g	L	
75	I	1906 Oct.	19.806	+ 7.3	.....	g	L	
75	I	1906 Nov.	1.790	+ 7.8	.....	g	L	
75	I	1908 Jan.	13.654	+ 3.2	.....	g	L	
76	I	1905 Nov.	10.721	+ 7.0	.....	g	S	
76	I	1924 Dec.	24.730	− 14.8	.....	f	S	
76	I	1924 Dec.	27.755	− 10.5	.....	g	S	
77	I	1903 Nov.	7.818	− 4.6	.....	g	A, F	
77	I	1903 Nov.	17.567	− 14.2	.....	g	A, F	
77	I	1903 Dec.	1.639	− 22.3	.....	g	A, F	
77	I	1903 Dec.	26.794	+ 11.8	.....	g	A, F	
77	I	1904 Jan.	23.641	− 16.3	.....	g	A, F	
77	I	1904 Sep.	30.894	− 9.6	.....	g	S	
77	I	1907 Sep.	23.767	− 22.9	.....	f	L	
77	I	1907 Sep.	24.897	+ 12.1	.....	g	L	
77	I	1907 Oct.	7.940	− 3.1	.....	g	L	
78	I	1903 Sep.	25.769	+ 89.9	.....	f	A	
78	I	1903 Sep.	26.860	+ 53.0	+ 17.7	g	A, F, I	
78	I	1903 Oct.	16.806	+ 81.5	+ 23.8	g	A, I	
78	I	1903 Oct.	23.778	+ 80.3	+ 1.6	g	A, I	

TABLE III—*Continued*

No.	Dis.	Date G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
78	I	1903 Oct. 24.970	+ 88.5	.....	g	A	
78	I	1903 Nov. 7.797	+ 57.4	+ 4.3	g	A, I	
78	I	1903 Dec. 1.660	+ 61.4	+ 18.8	g	A, I	
78	I	1903 Dec. 27.497	+ 78.3	+ 4.9	g	A, I	
78	I	1904 Apr. 15.599	+ 82.5	+ 19.8	g	A, I	
78	I	1904 Sep. 30.926	.....	− 3.0	p	I	
78	I	1904 Dec. 30.563	.....	+ 6.9	g	I	
78	I	1906 Aug. 10.889	.....	+ 18.0	g	I	
79	I	1917 Jan. 22.601	+ 7.1	.....	f	S	
79	I	1917 Feb. 2.526	+ 7.1	.....	f	S	
79	I	1924 Oct. 19.824	+ 18.2	.....	g	S	
80	I	1904 Oct. 21.805	+ 7.3	.....	f	L	
80	I	1906 Oct. 12.777	+ 21.2	.....	g	L	
80	I	1907 Oct. 7.921	+ 3.3	.....	f	L	
81	I	1903 Sep. 25.804	+ 14.0	.....	vg	L	
81	I	1903 Oct. 17.888	+ 18.7	.....	vg	L	
81	I	1903 Oct. 23.815	− 5.6	.....	vg	L	
81	I	1904 Sep. 13.845	− 4.2	.....	p	L	
81	I	1905 Jan. 9.579	− 20.4	.....	g	L	
82	I	1919 Sep. 15.903	+ 15.3	.....	g	S	
82	I	1925 Jan. 21.095	+ 22.9	+ 6.3	g	S	
82	I	1925 Jan. 23.052	+ 21.6	.....	f	S	
83	I	1917 Nov. 2.726	+ 23.7	.....	f	S	
83	I	1917 Nov. 23.714	+ 10.5	+ 1.8	f	S	
83	I	1918 Sep. 27.868	+ 31.8	.....	f	S	
84	I	1913 Sep. 12.919	+ 11.2	.....	g	S	
85	I	1903 Sep. 25.887	+ 24.6	.....	g	L, F	
85	I	1903 Oct. 10.746	+ 26.2	.....	g	L, A	
85	I	1904 Sep. 13.897	+ 9.5	.....	vg	L	
85	I	1910 Nov. 7.744	+ 21.2	.....	g	S	
86	I	1917 Nov. 16.718	− 8.6	.....	g	S	
87	I	1917 Nov. 5.776	− 6.9	+ 9.3	g	S	
87	I	1917 Dec. 24.648	− 6.1	− 5.9	g	S	
87	I	1918 Nov. 1.786	+ 8.8	+ 14.6	g	S	
88	I	1903 Sep. 25.846	+ 0.1	.....	f	S	
88	I	1903 Oct. 17.916	+ 7.7	.....	g	S	
88	I	1903 Nov. 7.844	− 0.7	+ 3.2	g	S	
88	I	1905 Oct. 2.886	− 1.0	.....	g	L	
89	I	1915 Jan. 4.615	+ 4.1	+ 36.8	f	S	
89	I	1924 Sept. 22.908	+ 11.5	− 26.4	g	S	
89	I	1925 Jan. 8.216	− 17.5	− 9.1	g	S	
89	I	1924 Oct. 16.954	+ 15.9	.....	g	S	
90	I	1919 Sep. 1.912	+ 48.9	.....	f	S	
90	I	1925 Jan. 8.216	− 14.6	− 9.1	f	S	
90	I	1925 Jan. 18.304	+ 22.1	.....	p	S	
91	I	1904 Nov. 18.771	+ 22.6	.....	g	I	
91	I	1906 Sep. 17.951	+ 28.2	.....	vg	I	
91	I	1906 Sept. 24.941	+ 20.3	.....	g	I	
91	I	1906 Oct. 31.832	+ 14.4	.....	g	I	
91	I	1906 Nov. 1.829	− 2.3	.....	g	I	
91	I	1906 Nov. 4.732	+ 21.1	.....	g	I	
91	II	1907 Nov. 11.906	+ 1.2	.....	g	Lz	
91	I	1912 Nov. 4.737	+ 9.0	+ 3.9	vg	L	
91	I	1912 Nov. 18.842	+ 18.9	+ 26.2	vg	L	
91	I	1912 Dec. 2.840	− 5.8	+ 15.5	vg	L	

TABLE III—*Continued*

No.	Dis.	Date G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
91	I	1912 Dec. 10.687	+ 36.3	.....	vg	L	
91	I	1913 Jan. 29.587	+ 19.9	+ 20.9	vg	L	
91	I	1913 Feb. 5.506	+ 23.6	+ 12.8	vg	L	
91	I	1915 Nov. 12.804	+ 32.9	.....	f	Lz	
91	I	1915 Nov. 23.770	+ 18.3	.....	vg	Lz	
91	I	1915 Dec. 14.681	+ 38.8	.....	vg	Lz	
91	I	1916 Jan. 3.692	+ 1.7	.....	vg	Lz	
91	I	1916 Jan. 31.763	− 14.2	.....	vg	Lz	
91	I	1916 Feb. 15.578	+ 7.0	.....	f	Lz	
92	I	1915 Nov. 2.735	+ 21.5	+ 29.7	g	S	
92	I	1915 Dec. 27.592	+ 11.0	.....	f	S	
93	I	1917 Oct. 15.833	+ 26.8	+ 17.8	g	S	
93	I	1917 Dec. 10.685	+ 24.8	+ 23.2	g	S	
94	I	1903 Feb. 25.533	+ 72.0	.....	g	F	
94	I	1903 Feb. 26.625	+ 34.8	.....	g	F	
94	I	1903 Mar. 5.547	− 3.2	.....	g	A	
94	I	1904 Nov. 18.738	+ 5.2	.....	vg	L	
94	I	1904 Dec. 30.608	+ 38.7	.....	vg	L	
94	I	1905 Sep. 18.832	− 17.1	.....	vg	L	
94	I	1907 Dec. 21.618	+ 49.6	.....	p	L	
94	I	1922 Nov. 10.662	− 20.6	.....	f	S	
95	I	1903 Oct. 10.823	+ 22.3	.....	f	A, F	
95	I	1903 Oct. 24.806	+ 32.4	.....	f	A, F	
95	I	1903 Dec. 1.692	+ 23.3	.....	g	A, F	
95	I	1904 Jan. 23.576	+ 5.1	.....	g	A	
95	I	1908 Dec. 26.673	+ 38.8	.....	vg	L	
96	I	1903 Feb. 19.769	+ 19.2	.....	g	A, F	
96	I	1903 Nov. 17.631	+ 4.3	− 6.6	g	L, F, A	
96	I	1903 Dec. 26.916	− 0.4	− 8.8	f	L, F, A	
96	I	1904 Jan. 2.896	+ 10.0	− 13.6	g	L, F, A	
96	I	1904 Feb. 26.715	+ 10.0	− 5.2	g	L, F, A	
96	I	1904 Mar. 8.729	+ 5.6	− 2.4	f	L, F, A	
96	I	1904 Mar. 19.668	+ 0.5	− 17.5	g	L, F, A	
96	I	1905 Dec. 4.707	+ 20.1	.....	p	L	
96	I	1905 Dec. 11.925	− 0.7	− 6.8	g	L	
96	I	1905 Dec. 25.909	+ 3.4	− 3.8	vg	L	
96	I	1906 Jan. 26.840	− 1.8	− 6.9	vg	L	
96	I	1906 Sep. 24.892	− 1.2	− 14.6	vg	L	
96	I	1906 Oct. 31.782	− 7.8	− 4.2	vg	L	
96	I	1907 Sep. 2.911	+ 10.8	.....	f	L	
96	I	1907 Sep. 23.934	+ 12.9	− 10.0	g	L	
96	I	1907 Sep. 24.925	− 1.7	− 7.9	g	L	
96	I	1907 Oct. 11.857	+ 25.9	− 8.9	vg	L	
96	I	1907 Oct. 18.831	+ 16.2	− 8.3	vg	L	
96	I	1907 Oct. 22.808	− 9.4	− 11.2	vg	L	
96	I	1907 Nov. 22.722	− 7.2	− 14.7	vg	L	
96	I	1907 Nov. 23.654	+ 1.2	− 13.6	p	L	
96	I	1907 Nov. 27.913	+ 18.9	+ 9.4	f	L	
96	I	1907 Nov. 30.735	+ 16.6	− 8.8	g	L	
96	I	1908 Oct. 30.949	− 1.5	− 11.9	g	L	
96	I	1908 Nov. 2.852	− 4.2	+ 2.4	vg	L	
96	I	1908 Nov. 10.957	− 1.8	− 0.4	g	L	
96	I	1909 Aug. 23.894	− 2.2	− 15.6	f	L	
96	I	1909 Sep. 10.923	− 11.5	.....	g	L	
96	I	1909 Oct. 18.762	+ 39.6	− 2.2	g	L	

TABLE III—*Continued*

No.	Dis.	Date	G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
96	I	1909 Oct.	29.950	− 13.8	− 10.5	g	L	
96	I	1909 Nov.	19.831	− 17.2	.....	f	L	
96	I	1909 Nov.	26.665	− 2.8	.....	p	L	
96	I	1909 Nov.	29.644	− 3.6	− 0.5	g	L	
96	I	1910 Feb.	7.617	+ 2.9	− 8.4	g	L	
96	I	1910 Sep.	19.908	+ 6.3	− 12.7	g	L	
96	I	1910 Dec.	23.655	+ 8.8	− 0.1	g	L	
96	I	1910 Dec.	29.657	− 9.2	− 1.6	vg	L	
96	I	1911 Feb.	10.538	+ 9.6	− 3.6	vg	L	
96	I	1911 Aug.	25.907	+ 45.6	− 2.4	g	L	
96	I	1911 Aug.	28.891	+ 14.6	− 7.4	g	L	
96	I	1911 Sep.	15.901	+ 11.4	− 2.4	g	L	
96	I	1911 Sep.	18.917	+ 31.0	− 6.5	vg	L	
96	I	1911 Oct.	23.792	+ 7.2	− 0.1	vg	L	
96	I	1911 Oct.	31.770	+ 36.0	− 5.5	vg	L	
96	I	1911 Nov.	7.646	+ 4.2	+ 1.0	g	L	
96	I	1911 Nov.	7.929	− 3.3	− 1.8	vg	L	
96	I	1911 Nov.	18.631	+ 9.1	− 1.7	vg	L	
96	I	1911 Nov.	25.903	+ 18.2	− 5.4	vg	L	
96	I	1911 Nov.	26.606	+ 7.0	+ 5.8	g	L	
96	I	1911 Nov.	26.887	+ 9.2	− 8.2	vg	L	
96	I	1911 Nov.	30.645	+ 14.7	− 6.2	vg	L	
96	I	1911 Dec.	3.617	+ 14.4	− 7.2	vg	L	
96	I	1911 Dec.	4.907	+ 11.0	− 4.2	vg	L	
96	I	1911 Dec.	12.719	+ 8.8	− 1.8	vg	L	
96	I	1911 Dec.	12.881	+ 6.8	− 4.6	g	L	
96	I	1911 Dec.	12.949	+ 5.6	− 2.0	g	L	
96	I	1911 Dec.	24.501	+ 7.8	− 3.0	g	L	
96	I	1911 Dec.	24.588	+ 6.9	− 6.2	g	L	
96	I	1912 Jan.	2.514	+ 6.4	+ 2.4	g	L	
96	I	1912 Jan.	2.587	+ 14.5	+ 0.6	g	L	
96	I	1912 Jan.	2.742	+ 4.8	− 5.6	p	L	
96	I	1912 Jan.	2.774	+ 2.6	+ 2.1	vp	L	
96	I	1912 Jan.	2.861	+ 11.4	+ 1.0	p	L	
96	I	1912 Jan.	6.533	+ 8.1	− 8.0	vg	L	
96	I	1912 Jan.	6.612	+ 11.2	− 9.4	vg	L	
96	I	1912 Jan.	6.687	+ 5.6	− 9.4	vg	L	
96	I	1912 Jan.	6.757	+ 0.8	− 11.8	g	L	
96	I	1912 Jan.	6.838	− 7.6	− 9.4	vg	L	
96	I	1912 Jan.	9.508	− 10.2	− 7.4	vg	L	
96	I	1912 Jan.	9.582	+ 5.0	− 12.3	vg	L	
96	I	1912 Jan.	9.735	+ 10.4	− 7.2	vg	L	
96	I	1912 Jan.	11.770	− 0.8	− 11.0	vg	L	
96	I	1912 Jan.	11.854	− 6.6	− 11.2	vg	L	
96	I	1912 Jan.	15.506	+ 17.9	− 7.8	vg	L	
96	I	1912 Jan.	15.583	− 27.2	− 1.3	vg	L	
96	I	1912 Jan.	15.660	− 4.0	− 8.6	vg	L	
96	I	1912 Jan.	15.726	− 8.9	− 10.1	vg	L	
96	I	1912 Jan.	15.789	− 3.6	− 6.6	vg	L	
96	I	1912 Jan.	15.861	− 2.8	− 7.4	vg	L	
96	I	1912 Jan.	23.512	+ 13.8	− 0.4	vg	L	
96	I	1912 Jan.	23.585	+ 17.6	− 2.7	vg	L	
96	I	1912 Jan.	23.670	+ 16.6	− 2.0	vg	L	
96	I	1912 Jan.	23.820	− 2.4	− 7.4	vg	L	
96	I	1912 Feb.	8.533	− 3.5	− 3.4	g	L	

TABLE III—*Continued*

No.	Dis.	Date	G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
96	I	1912 Feb.	8.700	+ 0.8	− 8.1	vg	L	
97	III	1902 Mar.	4.665	+ 13.0	.....	g	A	
97	III	1902 Nov.	27.870	− 1.5	.....	f	S, A, F	
97	III	1902 Dec.	17.624	+ 2.3	.....	g	F, S	
97	III	1903 Jan.	22.622	+ 2.4	.....	g	A, F	
97	I	1907 Oct.	11.904	+ 4.3	.....	g	Ca	
98	III	1902 Mar.	4.610	+ 28.0	.....	f	A, L	
98	III	1902 Dec.	17.712	+ 58.0	.....	f	A	
98	III	1902 Dec.	31.689	+ 71.4	.....	f	A, F	
98	III	1903 Jan.	1.743	+ 30.6	.....	p	A	
98	III	1903 Jan.	16.710	+ 7.5	.....	f	A	
98	III	1903 Jan.	21.562	− 31.9	.....	f	A, F	
98	III	1903 Jan.	22.688	+ 74.3	.....	f	A	
98	I	1907 Dec.	6.635	− 9.3	.....	vg	L	
98	I	1907 Dec.	6.772	− 2.2	.....	vg	L	
98	I	1907 Dec.	6.836	+ 12.3	.....	vg	L	
98	I	1907 Dec.	11.582	+ 80.4	.....	g	L	
98	I	1907 Dec.	20.630	− 29.3	.....	g	L	
98	I	1907 Dec.	20.824	− 33.1	.....	f	L	
98	I	1907 Dec.	28.537	+ 26.6	.....	g	L	
98	I	1907 Dec.	28.708	− 32.5	.....	g	L	
98	I	1907 Dec.	30.631	+ 58.6	.....	f	L	
98	I	1907 Dec.	30.800	+ 51.6	.....	g	L	
98	I	1908 Jan.	7.616	+ 15.6	.....	g	L	
98	I	1908 Jan.	7.686	− 11.4	.....	p	L	
98	I	1908 Jan.	14.639	+ 49.0	.....	vg	L	
98	I	1908 Jan.	14.744	+ 29.2	.....	g	L	
98	I	1908 Jan.	20.557	+ 26.7	.....	g	L	
98	I	1908 Jan.	20.676	+ 45.9	.....	g	L	
98	I	1908 Jan.	21.522	+ 69.0	.....	vg	L	
98	I	1908 Jan.	21.656	+ 71.6	.....	g	L	
98	I	1908 Sep.	18.956	+ 14.2	.....	g	L	
98	I	1908 Dec.	7.717	+ 53.0	.....	vg	L	
98	I	1908 Dec.	14.856	+ 33.9	.....	vg	L	
98	I	1909 Mar.	1.588	− 41.6	.....	vg	L	
98	I	1909 Oct.	25.828	+ 51.8	.....	g	L	
98	I	1909 Oct.	29.876	+ 72.5	.....	vg	L	
98	I	1909 Nov.	5.764	+ 51.0	.....	vg	L	
98	I	1909 Nov.	22.665	− 37.2	.....	vg	L	
98	I	1909 Dec.	17.624	+ 40.6	.....	g	L	
98	I	1909 Dec.	22.697	− 41.3	.....	vg	L	
98	I	1909 Dec.	22.861	− 38.0	.....	g	L	
98	I	1910 Jan.	3.547	+ 18.9	.....	vg	L	
98	I	1919 Jan.	3.780	+ 41.6	.....	g	L	
98	I	1910 Jan.	14.549	+ 11.3	.....	g	L	
98	I	1910 Jan.	14.822	+ 28.3	.....	vg	L	
98	I	1910 Jan.	18.556	+ 24.3	.....	g	L	
98	I	1910 Feb.	7.524	+ 39.7	− 29.0	g	L	
98	I	1910 Feb.	14.589	+ 71.8	.....	g	L	
98	I	1912 Sep.	30.961	− 17.3	.....	f	L	
98	I	1912 Oct.	4.849	− 21.0	.....	vg	L	
98	I	1912 Oct.	4.889	− 21.2	.....	vg	L	
98	I	1912 Oct.	14.944	+ 84.0	.....	vg	L	
98	I	1912 Oct.	14.956	+ 69.5	+ 61.3	vg	L	
98	I	1912 Oct.	25.793	+ 85.6	.....	g	L	

TABLE III—*Continued*

No.	Dis.	Date G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
98	I	1912 Oct. 25.849	+ 83.7	.....	g	L	
98	I	1912 Oct. 25.901	+ 77.4	.....	vg	L	
98	I	1912 Nov. 4.725	+ 13.7	.....	p	L	
98	I	1912 Nov. 4.846	+ 32.5	− 21.8	vg	L	
98	I	1912 Nov. 6.825	+ 8.0	.....	vg	L	
98	I	1912 Nov. 6.974	− 10.3	.....	g	L	
98	I	1912 Nov. 8.767	+ 63.1	.....	vg	L	
98	I	1912 Nov. 8.803	+ 64.2	.....	vg	L	
98	I	1912 Nov. 8.958	+ 79.6	.....	vg	L	
98	I	1912 Nov. 18.734	− 28.5	.....	vg	L	
98	I	1912 Nov. 18.892	− 16.8	.....	vg	L	
98	I	1912 Nov. 19.740	+ 32.3	.....	vg	L	
98	I	1912 Nov. 19.792	+ 55.6	.....	vg	L	
98	I	1912 Nov. 22.712	− 16.8	.....	vg	L	
98	I	1912 Nov. 22.765	+ 13.2	.....	vg	L	
99	I	1903 Oct. 23.852	+ 20.5	.....	vg	L, F, A	
99	I	1903 Dec. 1.719	+ 20.0	.....	g	A	
99	I	1904 Jan. 2.562	+ 25.5	.....	p	A	
99	I	1908 Dec. 26.713	+ 37.4	.....	g	L	
100	I	1915 Oct. 4.868	− 26.3	.....	g	F	
100	I	1915 Oct. 25.776	− 8.1	.....	g	F	
100	I	1915 Oct. 29.771	− 1.8	.....	g	F	
100	I	1915 Dec. 13.640	− 6.0	.....	g	F	
101	I	1910 Jan. 3.624	+ 11.6	+ 26.9	p	Ar, S	
101	I	1910 Oct. 11.889	+ 6.2	+ 9.3	p	Ar, S	
101	I	1911 Dec. 4.723	+ 37.8	+ 34.0	g	F, S	
101	I	1912 Jan. 9.656	+ 18.6	+ 10.4	g	S	
101	I	1919 Feb. 17.517	+ 21.4	+ 29.0	f	S	
102	III	1901 Oct. 2.844	+ 7.6	.....	g	A	
102	III	1902 Oct. 30.679	+ 5.9	.....	g	A	
102	II	1903 Sep. 19.924	+ 13.7	.....	g	L	
102	I	1903 Sep. 26.883	+ 5.6	.....	g	A	
102	II	1904 Sep. 6.909	+ 9.0	.....	g	L	
102	I	1908 Nov. 30.739	+ 6.0	.....	g	L	
102	I	1917 Sep. 10.949	− 8.2	.....	g	S	
102	I	1917 Sep. 17.955	+ 8.8	.....	g	S	
103	I	1915 Oct. 1.942	+ 41.2	+ 12.4	vg	F	
103	I	1915 Dec. 13.777	+ 38.0	.....	f	F	− 83.3, +159.4
103	I	1915 Dec. 14.732	+ 30.0	− 30.6	g	F	− 33.8, + 93.7
103	I	1915 Dec. 27.653	+ 58.8	+ 35.6	g	C	− 43.9, +141.5
103	I	1915 Dec. 28.746	+ 22.6	+ 26.5	g	C	− 36.8, + 81.9
103	I	1916 Jan. 3.640	+ 49.4	.....	g	C	
103	I	1916 Jan. 17.565	+ 52.2	.....	g	C	
103	I	1916 Jan. 17.728	+ 24.9	.....	f	C	
103	I	1916 Jan. 18.571	+ 47.0	+ 42.0	g	C	− 40.2, +134.2
103	I	1916 Jan. 18.653	+ 39.8	+ 32.9	g	C	− 54.8, +134.4
103	I	1916 Jan. 22.573	+ 23.6	.....	f	C	− 10.2, + 57.3
103	I	1916 Jan. 22.665	+ 31.8	+ 30.5	g	C	
103	I	1916 Jan. 23.681	+ 42.2	.....	g	C	− 33.6, +117.9
103	I	1916 Jan. 31.612	+ 28.5	.....	f	Lz	− 30.8, + 87.8
103	I	1916 Jan. 31.711	+ 36.8	.....	p	Lz	− 23.7, + 97.3
103	I	1916 Feb. 7.559	+ 32.6	.....	f	S	− 62.3, +127.6
103	I	1916 Feb. 15.632	+ 33.4	.....	f	Lz	− 61.7, +128.5
103	I	1916 Feb. 18.558	+ 18.1	+ 43.2	vp	S	+113.9, − 77.8
103	I	1916 Feb. 29.556	+ 30.8	.....	p	S	− 59.7, +121.3

TABLE III—*Continued*

No.	Dis.	Date G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
103	I	1916 Mar. 3.539	+ 29.3	.....	f	Lz	− 48.2,+106.8
103	I	1916 Mar. 3.591	+ 30.2	.....	g	Lz	− 51.3,+111.7
103	I	1916 Mar. 3.644	+ 33.2	.....	f	Lz, M	− 49.0,+115.5
103	I	1916 Mar. 10.540	+ 36.0	+ 71.0	f	Lz	− 35.2,+107.1
103	I	1916 Mar. 10.579	+ 40.2	.....	f	Lz	− 35.6,+116.1
103	I	1916 Mar. 10.619	+ 32.0	.....	g	Lz	− 49.8,+113.9
103	I	1916 Mar. 13.574	+ 38.1	.....	f	Lz	− 60.1,+136.3
103	I	1916 Mar. 17.554	+ 35.6	.....	f	Lz	− 32.5,+103.7
103	I	1916 Mar. 17.596	+ 53.0	.....	p	M	
103	I	1916 Mar. 20.553	+ 31.2	.....	f	S	− 14.4,+ 76.7
103	I	1916 Apr. 4.579	+ 46.8	.....	p	M	− 23.9,+117.6
103	I	1916 Apr. 14.564	+ 40.7	.....	vp	M	
103	I	1916 Sep. 8.942	+ 31.8	.....	f	M	− 55.1,+118.6
103	I	1916 Sep. 15.938	+ 36.0	.....	f	S	
103	I	1916 Sep. 20.942	+ 46.4	.....	g	M	− 44.3,+137.0
103	I	1916 Sep. 23.916	+ 31.0	.....	f	M	− 55.3,+117.2
103	I	1916 Oct. 4.826	+ 36.8	.....	f	M	− 45.3,+118.9
103	I	1916 Oct. 4.948	+ 28.6	.....	g	M	− 50.9,+108.1
103	I	1916 Oct. 7.818	+ 25.6	.....	f	M	− 47.8,+ 98.9
103	I	1916 Oct. 13.833	+ 36.9	.....	g	M	
103	I	1916 Oct. 13.955	+ 30.2	.....	g	M	
103	I	1916 Oct. 27.720	+ 22.3	.....	g	M	
103	I	1916 Oct. 27.935	+ 42.1	.....	f	M	
103	I	1916 Nov. 4.763	+ 42.2	− 24.0	g	M	
103	I	1916 Nov. 4.875	+ 29.8	.....	g	M	
103	I	1916 Nov. 10.699	+ 33.6	+ 45.6	vg	M	
103	I	1916 Nov. 10.803	+ 23.4	.....	f	S	
103	I	1916 Nov. 29.868	+ 35.1	.....	p	M	
103	I	1917 Jan. 1.541	+ 20.0	.....	vg	M	− 43.6,+ 83.5
103	I	1917 Jan. 5.731	+ 29.0	+ 26.6	g	M	− 52.6,+110.7
103	I	1917 Jan. 8.642	+ 13.6	.....	f	S	− 88.8,+116.0
103	I	1917 Jan. 19.651	+ 22.6	+ 39.6	vg	M	− 76.2,+121.3
103	I	1917 Jan. 19.754	+ 20.1	.....	p	S	− 56.0,+106.2
103	I	1917 Mar. 23.567	+ 38.9	.....	p	M	− 8.6,+ 86.4
103	I	1917 Dec. 21.639	+ 27.8	+ 26.2	g	S, W	
103	I	1918 Jan. 7.606	+ 41.9	.....	g	S	
103	I	1918 Jan. 18.628	+ 16.1	.....	f	Bk	
103	I	1918 Mar. 1.540	+ 24.3	.....	f	Bk	− 66.5,+115.1
103	I	1918 Mar. 15.549	+ 28.5	.....	g	Bk	− 81.2,+138.2
103	I	1918 Mar. 22.560	+ 37.6	.....	f	S, W	
103	I	1919 Feb. 7.661	+ 30.6	.....	g	Bk	− 63.0,+142.3
103	I	1919 Feb. 10.531	+ 32.4	.....	g	Bk	− 45.4,+110.2
103	I	1920 Jan. 9.687	+ 49.9	.....	f	Bk	− 29.7,+129.5
103	I	1920 Feb. 9.639	+ 23.4	.....	f	S	− 76.5,+123.4
103	I	1920 Feb. 23.578	+ 23.9	.....	vp	S	− 61.5,+109.3
103	I	1920 Mar. 5.619	+ 40.3	.....	p	S	− 66.0,+146.6
103	I	1920 Mar. 8.564	+ 14.5	.....	f	S	− 83.6,+112.6
103	I	1920 Nov. 12.743	+ 25.7	.....	f	Bk	
103	I	1920 Nov. 15.739	+ 45.6	.....	f	Bk	
103	I	1920 Nov. 19.829	+ 43.6	.....	f	Bk	− 38.5,+125.7
103	I	1920 Dec. 6.701	+ 37.4	.....	f	S	− 54.6,+129.5
103	I	1920 Dec. 27.659	+ 6.2	.....	f	Bk	
103	I	1921 Jan. 28.550	+ 40.2	.....	f	Bk	− 36.4,+116.7
103	I	1921 Jan. 31.565	+ 29.8	.....	p	Bk	− 41.0,+ 99.6
103	I	1921 Feb. 4.591	+ 26.8	.....	p	S	− 38.9,+ 91.6

TABLE III—*Continued*

No.	Dis.	Date G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
103	I	1921 Feb. 14.560	− 1.6	.....	vp	Bk	− 51.7,+ 48.4
103	I	1921 Feb. 18.583	+ 17.0	.....	g	S	− 83.3,+117.3
103	I	1921 Oct. 31.851	+ 40.2	.....	f	S	− 23.2,+103.6
103	I	1921 Nov. 11.808	+ 38.7	.....	p	S	− 32.6,+100.0
103	I	1922 Jan. 9.592	+ 28.3	.....	vg	S	
103	I	1922 Jan. 13.586	+ 34.3	+ 29.8	g	S	− 51.5,+120.1
103	I	1922 Jan. 16.716	+ 28.8	.....	vp	S	− 62.4,+120.0
103	I	1922 Jan. 27.608	+ 22.9	.....	f	S	− 75.7,+121.5
103	I	1922 Jan. 30.602	+ 37.4	.....	f	S	− 50.3,+125.1
104	I	1917 Sep. 21.910	+ 31.3	+ 30.9	g	S	
104	I	1917 Dec. 31.623	+ 14.6	+ 23.3	g	S	
104	I	1924 Dec. 13.210	+ 12.2	.....	f	S	
105	I	1910 Jan. 14.579	− 33.7	.....	f	S	
105	I	1910 Dec. 16.685	− 8.8	.....	p	S	
105	I	1917 Sep. 28.866	+ 21.2	.....	f	S	
105	I	1918 Jan. 4.631	+ 36.0	.....	p	S	
106	I	1910 Jan. 14.614	− 13.7	.....	f	S, L	
106	I	1910 Dec. 16.733	+ 56.3	.....	f	S, L	
106	I	1913 Nov. 3.765	+ 58.5	.....	f	S	
106	I	1913 Nov. 21.758	+ 35.0	.....	f	S	
107	I	1910 Jan. 14.647	− 2.6	.....	p	L	
107	I	1912 Oct. 28.797	− 6.5	.....	g	L	
107	I	1912 Dec. 13.661	+ 18.7	.....	vg	L	
108	I	1924 Dec. 9.915	+ 57.8	+ 5.2	g	S	
109	III	1901 Sep. 4.905	+ 21.6	.....	f	A	
109	III	1901 Sep. 26.871	+ 15.7	.....	f	F	
109	III	1901 Oct. 3.809	+ 20.4	.....	g	F, A	
109	III	1901 Oct. 18.538	+ 20.7	.....	g	A, F	
109	III	1901 Oct. 31.832	+ 19.8	.....	g	A	
109	III	1901 Nov. 7.754	+ 23.7	.....	g	A	
109	III	1901 Nov. 8.838	+ 23.7	.....	g	A	
109	III	1901 Nov. 14.805	+ 24.3	.....	g	A	
109	III	1901 Nov. 15.786	+ 22.9	.....	g	A	
109	III	1901 Nov. 27.890	+ 21.1	.....	g	A	
109	III	1901 Dec. 18.758	+ 22.4	.....	g	A	
109	III	1901 Dec. 19.732	+ 21.1	.....	g	A	
109	III	1901 Dec. 31.633	+ 22.8	.....	g	A, F	
109	III	1902 Jan. 4.739	+ 23.9	.....	f	A	
109	III	1902 Jan. 8.760	+ 24.6	.....	g	A	
109	III	1902 Jan. 9.612	+ 23.4	.....	g	A, F	
109	III	1902 Jan. 16.710	+ 17.7	.....	g	A, F	
109	III	1902 Jan. 24.535	+ 20.2	.....	g	F, A	
109	III	1902 Feb. 10.621	+ 22.2	.....	g	A	
109	III	1902 Mar. 3.572	+ 19.9	.....	g	A	
109	I	1909 Mar. 1.560	+ 24.6	+ 22.0	vg	L	
110	I	1903 Dec. 1.744	+ 5.8	.....	g	A, F	
110	I	1904 Jan. 23.664	+ 11.7	.....	g	A	
110	I	1904 Nov. 1.922	+ 25.6	.....	g	I	
110	I	1905 Dec. 11.707	+ 36.2	.....	vg	I	
110	I	1906 Oct. 12.892	+ 20.6	.....	f	I	
110	I	1906 Oct. 19.844	+ 27.3	.....	f	I	
110	I	1906 Oct. 31.897	+ 17.9	.....	f	I	
110	I	1906 Nov. 1.861	+ 25.9	.....	vg	I	
110	I	1906 Nov. 4.958	+ 16.4	.....	g	I	
110	I	1906 Nov. 9.864	+ 15.4	.....	g	I	

TABLE III—*Continued*

No.	Dis.	Date	G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
110	I	1906 Dec.	17.710	+ 28.7	.....	g	L	
110	I	1907 Feb.	2.638	+ 22.8	+ 10.6	vg	L	
110	I	1908 Feb.	2.687	+ 25.6	.....	p	L	
111	I	1911 Dec.	21.689	+ 8.7	+ 16.8	g	S	
111	I	1916 Jan.	10.644	− 4.1	.....	p	S	
111	I	1924 Sep.	12.928	+ 3.5	.....	g	S	
112	I	1910 Jan.	14.683	+ 19.7	+ 28.6	f	Ar	
112	I	1910 Feb.	22.583	+ 10.1	.....	p	Ar	
112	I	1911 Jan.	23.661	+ 22.1	+ 2.2	vg	Ar	
112	I	1917 Sep.	28.915	+ 32.0	.....	p	S	
113	I	1903 Feb.	19.666	+ 32.6	.....	g	A	
113	I	1903 Feb.	25.565	+ 30.5	.....	g	F	
113	III	1903 Mar.	6.601	+ 30.4	.....	f	A	
113	I	1903 Sep.	5.910	+ 19.3	.....	g	F, A	
113	I	1903 Sep.	18.907	+ 31.6	.....	g	A, F	
113	I	1903 Sep.	26.913	+ 26.0	.....	g	A	
113	I	1903 Oct.	10.857	+ 31.0	.....	p	A	
113	I	1903 Oct.	17.949	+ 26.0	.....	g	A	
113	I	1903 Oct.	24.837	+ 32.5	.....	g	A	
114	I	1914 Feb.	25.578	+ 3.5	+ 22.4	g	S	
114	I	1916 Nov.	4.815	+ 11.8	+ 5.2	g	S	
114	I	1917 Jan.	24.596	+ 41.3	.....	g	S	
115	I	1917 Jan.	3.678	+ 9.8	.....	vg	S	
115	I	1924 Oct.	19.862	+ 3.0	.....	f	S	
115	I	1924 Nov.	9.843	+ 29.4	.....	g	S	
116	III	1901 Nov.	27.846	− 68.7	.....	g	A	
116	III	1901 Dec.	6.691	+ 14.5	.....	g	A	
116	III	1901 Dec.	18.703	+ 53.9	.....	g	A	
116	III	1901 Dec.	19.676	− 55.1	.....	g	A	
116	III	1901 Dec.	31.585	+115.5	.....	g	A	
116	III	1901 Dec.	31.835	+136.4	.....	g	A	
116	III	1902 Jan.	4.691	− 56.0	.....	g	A	
116	III	1902 Jan.	8.722	+129.4	.....	g	A	
116	III	1902 Jan.	9.568	+178.5	.....	g	A	
116	III	1902 Jan.	16.551	+115.0	.....	g	A	
116	III	1902 Jan.	16.762	+131.2	.....	g	A, F	
116	III	1902 Jan.	22.589	− 81.1	.....	g	A	
116	III	1902 Jan.	24.569	+117.5	.....	g	A	
116	III	1902 Feb.	10.565	+176.8	.....	g	A	
116	III	1902 Feb.	11.524	+157.5	.....	g	A	
116	III	1902 Feb.	12.629	+ 51.1	.....	g	A	
116	III	1902 Feb.	19.598	+150.4	.....	g	A	
116	III	1902 Feb.	21.549	− 50.4	.....	g	A	
116	III	1902 Mar.	13.562	+119.4	.....	g	A	
116	III	1902 Mar.	27.563	− 80.1	.....	g	A	
116	III	1902 Apr.	3.542	−108.6	.....	g	A	
116	III	1902 Sep.	3.908	− 29.7	.....	g	A	
116	III	1902 Sep.	4.892	+ 79.2	.....	g	A	
116	III	1902 Sep.	13.901	+166.0	.....	g	A	
116	III	1902 Oct.	8.818	+172.4	.....	g	A	
116	III	1902 Oct.	15.888	+163.7	.....	f	A	
116	III	1902 Nov.	6.769	− 39.5	.....	g	A	
116	III	1902 Nov.	19.822	− 12.8	.....	p	A	
116	III	1903 Jan.	22.688	+ 73.9	.....	g	A	
117	I	1903 Oct.	23.892	+ 20.7	.....	g	S	

TABLE III—*Continued*

No.	Dis.	Date	G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
117	I	1903 Oct.	24.940	+ 22.9	.....	f	S	
117	I	1904 Nov.	11.892	+ 12.2	.....	g	S	
117	I	1905 Jan.	9.646	+ 24.5	.....	f	S	
117	I	1908 Jan.	21.628	+ 14.3	.....	g	S	
118	III	1901 Sep.	11.897	+ 15.8	.....	f	A	
118	III	1901 Oct.	2.899	+ 16.6	.....	g	A	
118	III	1901 Nov.	8.860	+ 18.6	.....	f	A, F	
118	III	1901 Nov.	27.913	+ 21.5	.....	f	F	
118	III	1901 Dec.	31.651	+ 17.4	.....	g	A, F	
118	III	1902 Mar.	13.662	+ 14.8	.....	f	A	
118	III	1902 Apr.	9.628	+ 19.3	.....	g	A, F	
118	III	1903 Apr.	3.594	+ 19.7	.....	vg	F	
118	I	1903 Nov.	21.733	+ 13.0	.....	g	F	
118	I	1910 Feb.	18.546	+ 10.0	.....	vg	F	
118	I	1910 Feb.	21.535	+ 8.4	.....	p	F	
118	I	1910 Feb.	22.550	+ 11.3	.....	g	F	
118	I	1910 Feb.	28.599	+ 24.3	.....	vg	F	
118	I	1910 Mar.	7.531	+ 1.2	.....	f	F	
118	I	1910 Mar.	14.543	+ 4.0	.....	f	F	
119	III	1902 Oct.	30.812	+ 16.7	.....	g	A	
119	III	1902 Nov.	6.879	+ 17.6	.....	g	A	
119	III	1902 Nov.	7.658	+ 11.5	.....	g	A, F	
119	I	1908 Nov.	30.756	+ 10.3	+ 17.7	g	L	
119	I	1911 Jan.	17.590	+ 8.1	− 6.9	g	L	
120	I	1914 Dec.	15.185	+ 81.7	.....	p	S	
120	I	1915 Mar.	30.585	− 7.2	.....	g	S	
120	I	1916 Oct.	16.865	+ 38.1	.....	g	S	
121	I	1913 Sep.	10.911	+ 24.3	.....	vp	S	
121	I	1915 Dec.	7.785	+ 22.3	+ 22.0	g	S	
121	I	1915 Dec.	13.701	+ 16.4	.....	f	S	
121	I	1915 Dec.	27.849	+ 14.0	+ 20.4	g	S	
122	I	1903 Feb.	4.619	−120.4	.....	p	A	
122	III	1903 Feb.	18.653	+150.0	.....	g	F	
122	III	1903 Mar.	12.576	− 29.2	.....	f	F	
122	I	1904 Nov.	11.938	− 35.7	.....	g	L	
122	I	1905 Jan.	9.692	− 80.5	.....	g	L	
123	I	1903 Oct.	23.937	+ 18.4	.....	p	A	
123	I	1903 Nov.	7.885	+ 23.0	.....	g	A	
123	I	1904 Jan.	2.824	+ 37.0	.....	g	A	
124	I	1924 Dec.	24.797	+ 4.8	.....	p	S	
124	I	1925 Jan.	18.124	+ 24.8	− 16.1	g	S	
124	I	1925 Jan.	19.216	+ 28.3	.....	f	S	
125	I	1903 Sep.	5.825	+ 25.9	.....	g	C, A, F	
125	I	1903 Oct.	10.782	+ 11.3	.....	g	C, A, F	
125	I	1903 Oct.	16.844	+ 12.6	.....	g	C, A, F	
126	I	1919 Jan.	31.636	+ 23.5	+ 20.4	g	S	
127	I	1904 Nov.	18.981	+ 11.8	.....	f	S	
127	I	1904 Dec.	30.712	− 84.1	.....	g	S	
127	I	1905 Oct.	2.942	− 22.2	.....	f	S	
127	I	1906 Jan.	29.616	− 49.5	.....	g	S	
127	I	1906 Jan.	29.625	− 54.1	.....	f	S	
128	I	1908 Dec.	26.860	+ 16.8	.....	vg	L	
128	I	1908 Dec.	28.698	+ 20.3	.....	vg	L	
128	I	1911 Dec.	3.667	+ 23.6	.....	vg	L	
129	I	1914 Oct.	20.881	+ 0.4	+ 26.3	g	S	

TABLE III—*Continued*

No.	Dis.	Date G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
130	I	1917 Jan. 17.654	+ 33.3	+ 14.1	g	S	
130	I	1924 Oct. 19.903	+ 34.8	.....	g	S	
130	I	1924 Nov. 5.896	+ 33.6	+ 31.5	f	S	
130	I	1924 Nov. 9.759	+ 35.2	.....	g	S	
130	I	1924 Nov. 15.776	+ 33.1	+ 27.3	g	S	
131	I	1905 Nov. 10.769	+ 45.5	.....	f	S	
131	I	1925 Jan. 11.158	+ 6.8	+ 11.9	g	S	
131	I	1925 Jan. 18.206	− 5.9	.....	f	S	
132	I	1915 Dec. 27.774	+ 13.6	.....	f	S	
132	I	1920 Nov. 12.909	− 20.0	+ 1.7	g	S	
132	I	1924 Nov. 2.931	+ 16.6	.....	f	S	
133	I	1903 Sep. 18.871	+ 37.7	+ 30.2	g	L, A	
133	I	1903 Nov. 14.937	+ 33.1	+ 4.4	g	L, A	
133	I	1904 Jan. 2.859	+ 36.2	+ 8.4	g	L, A	
133	I	1904 Nov. 18.813	+ 40.8	+ 21.5	g	L	
133	I	1907 Feb. 2.674	+ 45.5	+ 10.0	g	L, Mi	
133	I	1907 Oct. 18.877	+ 41.5	+ 26.7	vg	L, G	
133	I	1909 Oct. 18.865	+ 39.8	+ 28.2	vg	L	
133	I	1909 Oct. 25.858	+ 19.6	.....	g	L	
133	I	1909 Nov. 25.849	+ 11.2	.....	g	L	
133	I	1909 Nov. 29.844	+ 9.7	.....	p	L	
133	I	1909 Dec. 17.658	+ 11.5	+ 11.4	g	L	
133	I	1909 Dec. 22.733	+ 20.6	+ 20.2	vg	L	
133	I	1909 Dec. 29.677	+ 21.0	+ 7.4	vg	L	
133	I	1910 Jan. 18.743	+ 19.2	+ 6.8	vg	L	
133	I	1910 Feb. 7.556	+ 23.3	+ 15.0	g	L	
133	I	1910 Feb. 14.632	+ 24.4	+ 3.0	vg	L	
133	I	1910 Dec. 29.713	+ 24.7	+ 7.8	vg	L	
133	I	1911 Oct. 31.838	+ 29.2	+ 19.6	vg	L	
133	I	1911 Nov. 7.986	+ 32.6	+ 36.4	vg	L	
133	I	1911 Nov. 12.756	+ 29.0	+ 11.7	vg	L	
133	I	1911 Nov. 18.713	+ 31.9	+ 17.0	g	L	
133	I	1911 Nov. 26.756	+ 30.1	+ 24.6	vg	L	
133	I	1911 Dec. 3.701	+ 31.0	+ 21.4	vg	L	
133	I	1911 Dec. 10.732	+ 29.9	+ 19.9	g	L	
133	I	1911 Dec. 21.748	+ 27.7	+ 19.9	g	M	
133	I	1912 Oct. 25.929	+ 32.6	+ 14.4	vg	L	
133	I	1912 Nov. 4.789	+ 33.0	+ 16.5	g	S	
133	I	1912 Nov. 18.789	+ 31.5	+ 10.5	g	S	
133	I	1912 Nov. 29.765	+ 31.2	+ 15.0	g	S	
133	I	1912 Dec. 6.711	+ 31.0	+ 11.0	g	S	
133	I	1912 Dec. 23.663	+ 28.8	− 4.2	g	S	
133	I	1912 Dec. 24.638	+ 30.8	+ 26.9	g	S	
133	I	1912 Dec. 27.735	+ 38.3	.....	p	S	
133	I	1913 Jan. 8.575	+ 30.0	+ 24.0	g	S	
133	I	1913 Jan. 13.576	+ 32.3	+ 20.7	g	S	
133	I	1913 Jan. 13.706	+ 30.8	+ 22.5	g	S	
133	I	1913 Jan. 20.624	+ 24.6	+ 18.6	g	S	
133	I	1917 Mar. 23.631	+ 26.7	.....	f	S	
133	I	1922 Jan. 30.749	+ 37.9	+ 13.2	f	S	
133	I	1922 Sep. 15.901	+ 42.4	.....	g	S	
133	I	1922 Sep. 22.891	+ 44.1	.....	p	S	
133	I	1922 Sep. 22.913	+ 45.5	.....	p	S	
133	I	1922 Sep. 22.935	+ 49.0	.....	p	S	
133	I	1922 Sep. 23.960	+ 51.7	.....	p	S	

TABLE III—*Continued*

No.	Dis.	Date G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
133	I	1922 Sep. 25.961	+ 47.5	+ 27.2	g	S	
133	I	1922 Sep. 29.783	+ 49.2	.....	g	S	
133	I	1922 Sep. 29.812	+ 46.0	.....	g	S	
133	I	1922 Sep. 29.851	+ 48.6	.....	p	S	
133	I	1922 Sep. 29.876	+ 53.5	.....	p	S	
133	I	1922 Sep. 29.962	+ 43.0	.....	p	S	
133	I	1922 Oct. 2.885	+ 44.6	+ 21.5	g	S	
133	I	1922 Oct. 9.817	+ 49.1	+ 31.3	f	S	
133	I	1922 Oct. 30.901	+ 44.2	+ 17.3	f	S	
133	I	1922 Nov. 3.692	+ 41.2	.....	f	S	
133	I	1922 Nov. 6.751	+ 47.3	+ 27.8	f	S	
134	III	1901 Sep. 18.909	+ 36.4	.....	f	A	
134	III	1901 Nov. 15.785	+ 38.5	.....	g	A	
134	III	1902 Oct. 29.883	+ 39.5	.....	f	A, F	
134	III	1902 Nov. 7.731	+ 39.7	.....	g	A	
134	I	1903 Oct. 10.931	+ 41.3	.....	p	L	
134	I	1904 Nov. 18.850	+ 25.0	+ 12.6	g	L	
134	I	1907 Nov. 23.073	+ 32.0	.....	g	G	
134	I	1910 Feb. 18.573	+ 39.2	+ 23.2	vg	L	
134	I	1910 Feb. 28.625	+ 20.8	+ 17.8	vg	L	
134	I	1914 Jan. 14.606	+ 26.3	+ 4.8	g	S	
134	I	1925 Jan. 5.301	+ 27.5	+ 7.4	g	S	
134	I	1925 Jan. 21.138	+ 24.0	+ 19.0	g	S	
134	I	1925 Jan. 21.202	+ 22.9	.....	f	S	
135	I	1924 Sep. 17.913	+ 53.6	.....	f	S	
135	I	1925 Jan. 6.766	+ 6.8	.....	g	S	
135	I	1925 Jan. 21.177	+ 29.6	.....	p	S	
136	I	1905 Dec. 11.766	+ 36.4	.....	g	Ar	
136	I	1906 Jan. 29.671	+ 29.2	.....	g	Ar	
136	I	1906 Oct. 12.938	+ 28.3	.....	g	Ar	
136	I	1907 Jan. 25.701	+ 29.8	.....	g	Ar	
137	I	1905 Feb. 10.642	+ 28.0	+ 9.0	g	Ar	
137	I	1905 Mar. 3.565	+ 29.2	+ 20.2	g	Ar	
137	I	1905 Apr. 3.596	+ 35.3	.....	g	Ar	
137	I	1905 Dec. 11.735	+ 30.4	.....	g	Ar	
137	I	1907 Jan. 25.744	+ 20.0	.....	g	Ar	
138	I	1903 Oct. 10.905	+ 48.9	.....	g	L	
138	I	1903 Oct. 23.965	+ 33.8	.....	g	L	
138	I	1904 Nov. 18.894	+ 55.8	.....	g	L	
139	I	1903 Oct. 24.884	+ 56.7	.....	f	A, F	
139	I	1903 Dec. 1.772	− 1.8	.....	g	A, F	
139	I	1903 Dec. 27.695	+ 25.6	.....	f	A, F	
139	I	1903 Dec. 31.658	+ 16.2	.....	g	A, F	
139	I	1904 Jan. 2.639	+ 21.9	.....	g	A	
139	I	1904 Jan. 29.589	+ 37.0	.....	p	A	
139	I	1904 Feb. 26.560	+ 37.4	.....	g	A, F	
139	I	1904 Dec. 30.665	+ 24.0	.....	g	S	
139	I	1905 Feb. 13.562	+ 1.7	.....	f	S	
139	I	1907 Nov. 30.799	+ 15.0	.....	f	S	
139	I	1907 Dec. 6.877	+ 11.0	.....	p	S	
139	I	1923 Feb. 22.635	+ 12.9	.....	f	S	
139	I	1924 Jan. 19.658	+ 7.5	.....	g	S	
139	I	1924 Jan. 26.615	+ 32.8	+ 18.3	g	S	
139	I	1924 Feb. 10.605	+ 14.4	.....	g	S	
139	I	1924 Feb. 23.606	+ 28.2	+ 31.1	g	S	

TABLE III—*Continued*

No.	Dis.	Date G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
139	I	1924 Feb. 23.656	+ 11.7	+ 24.0	g	S	
139	I	1924 Feb. 24.611	+ 14.8	.....	g	S	
139	I	1924 Mar. 1.581	+ 27.0	+ 37.9	g	S	
139	I	1924 Mar. 8.566	+ 43.0	.....	f	S	
139	I	1924 Mar. 15.552	+ 34.0	+ 17.5	g	S	
139	I	1924 Sep. 24.944	+ 48.5	.....	p	S	
139	I	1924 Sep. 28.943	+ 21.6	.....	p	S	
140	I	1903 Dec. 1.810	+ 20.8	.....	p	F	
140	I	1904 Jan. 2.704	+ 22.5	.....	f	A, F	
140	I	1904 Feb. 26.638	+ 18.3	.....	g	A, F	
141	I	1903 Dec. 31.746	+ 28.8	.....	f	F	
141	I	1904 Mar. 8.630	+ 47.1	.....	g	F, A	
141	I	1905 Jan. 27.601	+ 46.5	.....	g	F	
141	I	1905 Feb. 3.601	+ 59.8	.....	g	F	
141	I	1906 Mar. 5.595	+ 33.0	.....	g	F	
141	I	1906 Oct. 19.912	+ 4.6	.....	g	F	
141	I	1907 Jan. 5.726	+ 20.0	.....	f	F	
141	I	1907 Feb. 15.596	+ 15.2	.....	g	F	
142	I	1905 Feb. 6.576	+ 26.0	.....	vg	L	
142	I	1905 Dec. 9.712	+ 29.1	.....	g	L	
142	I	1907 Dec. 15.706	+ 37.6	.....	g	L	
142	I	1908 Dec. 28.767	+ 17.6	.....	f	L	
143	I	1903 Dec. 31.610	+ 87.2	.....	f	F, A	
143	I	1904 Jan. 2.594	+ 86.4	.....	p	F, A	
143	I	1904 Jan. 23.534	+ 45.6	.....	p	F, A	
143	I	1904 Jan. 29.551	− 48.1	.....	g	F, A	
143	I	1905 Feb. 13.604	− 30.1	.....	p	S	
143	I	1907 Dec. 30.707	− 12.6	.....	p	S	
143	I	1908 Jan. 7.657	+ 87.6	.....	f	S	
143	I	1908 Jan. 20.594	+ 2.4	.....	vp	S	
143	I	1908 Feb. 3.607	+ 9.9	.....	g	S	
143	I	1922 Feb. 20.574	+109.9	.....	f	S	
143	I	1922 Feb. 20.602	+ 93.9	.....	f	S	
143	I	1923 Mar. 2.607	+ 63.3	.....	f	S	
143	I	1923 Mar. 7.641	+ 44.4	+ 20.6	g	S	
143	I	1923 Mar. 16.583	+ 18.2	+ 11.2	vg	S	
143	I	1923 Mar. 23.592	+ 98.3	+ 40.6	g	S	
143	I	1923 Mar. 26.585	+ 75.3	+ 8.0	f	S	
143	I	1923 Mar. 30.577	− 14.4	+ 20.0	vg	S	
143	I	1923 Oct. 2.944	+ 49.7	.....	p	S	
143	I	1923 Oct. 7.898	− 54.8	.....	f	S	
143	I	1923 Oct. 14.877	+ 69.5	.....	f	S	
143	I	1923 Oct. 20.901	+112.5	.....	vp	S	
143	I	1923 Oct. 21.903	+ 95.5	+ 6.5	vg	S	
143	I	1923 Oct. 22.874	+ 84.8	.....	g	S	
143	I	1923 Nov. 6.815	+118.1	.....	g	S	
143	I	1923 Nov. 10.836	+117.8	.....	f	S	
143	I	1923 Nov. 17.825	− 77.0	+ 25.9	vg	S	
143	I	1923 Dec. 2.715	+111.2	.....	f	S	
143	I	1923 Dec. 15.779	+ 55.2	+ 2.3	g	S	
143	I	1924 Jan. 5.674	+ 72.2	+ 16.4	g	S	
143	I	1924 Jan. 6.693	+ 85.6	+ 10.6	g	S	
143	I	1924 Jan. 12.599	+138.9	+ 1.9	g	S	
143	I	1924 Jan. 12.743	+153.6	+ 11.4	g	S	
143	I	1924 Jan. 19.593	− 44.7	+ 26.7	g	S	

TABLE III—*Continued*

No.	Dis.	Date	G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
143	I	1924 Jan.	19.735	− 54.5	+ 14.6	g	S	
143	I	1924 Jan.	20.619	− 82.4	− 2.1	f	S	
143	I	1924 Jan.	26.553	+ 59.8	− 0.7	vg	S	
143	I	1924 Jan.	26.672	+ 65.8	+ 2.8	g	S	
143	I	1924 Feb.	10.544	− 84.0	+ 8.9	g	S	
143	I	1924 Feb.	10.676	− 74.0	.....	g	S	
144	III	1902 Jan.	24.618	+ 74.9	.....	p	F	
144	I	1903 Sep.	5.937	+ 20.0	.....	g	F, A	
144	I	1903 Sep.	25.915	+ 46.9	.....	f	F, A	
144	I	1903 Sep.	26.940	+ 57.1	.....	g	F, A	
144	I	1903 Oct.	17.972	+ 35.8	.....	g	A	
144	I	1903 Oct.	23.984	+ 47.0	.....	g	F, A	
144	I	1903 Oct.	24.860	(− 1.6)	.....	g	A	
144	I	1903 Oct.	30.833	+ 90.3	.....	g	F, A	
145	III	1901 Sep.	4.924	+ 28.5	.....	f	A	
145	I	1901 Nov.	13.826	+ 26.3	.....	g	A, F	
145	III	1902 Mar.	13.633	+ 25.0	.....	p	A, F	
145	III	1902 Apr.	9.598	+ 28.8	.....	f	A, F	
145	I	1903 Dec.	26.722	+ 31.6	.....	g	L	
145	I	1905 Jan.	21.659	+ 24.6	.....	vg	L	
145	I	1908 Jan.	14.663	+ 28.5	+ 26.6	g	L	
145	I	1908 Jan.	17.757	+ 31.7	+ 36.6	g	L	
145	I	1908 Jan.	20.626	+ 30.4	+ 18.6	p	L	
145	I	1908 Feb.	17.569	+ 18.3	+ 14.6	g	L	
145	I	1908 Feb.	21.555	+ 31.0	+ 27.1	g	L	
145	I	1908 Oct.	2.959	+ 36.7	+ 19.0	vg	L	
145	I	1908 Oct.	9.967	+ 31.1	.....	p	L	
145	I	1908 Oct.	16.969	+ 27.2	.....	p	L	
145	I	1908 Oct.	30.995	+ 30.9	+ 22.6	p	L	
145	I	1908 Dec.	14.875	+ 39.1	+ 25.0	g	L	
145	I	1908 Dec.	26.646	+ 29.6	+ 27.2	vg	L	
145	I	1909 Jan.	1.750	+ 19.7	+ 20.0	vg	L	
147	I	1911 Dec.	3.748	(+ 15.0)	.....	vg	L	
147	I	1912 Dec.	10.733	+ 62.9	.....	g	L	
147	I	1912 Dec.	31.656	0.0	(+ 0.7)	vg	L	
148	I	1903 Oct.	10.953	+ 11.3	.....	p	A, F	
148	I	1903 Dec.	1.872	+ 18.6	.....	g	A, F	
148	I	1903 Dec.	25.853	+ 35.3	.....	f	A, F	
148	I	1904 Jan.	2.760	+ 14.6	.....	g	A, F	
148	I	1923 Sep.	11.949	+ 42.7	+ 11.9	g	S	
148	I	1923 Sep.	15.901	+ 27.6	.....	g	S	
148	I	1923 Sep.	18.951	+ 50.1	.....	p	S	
148	I	1923 Sep.	23.894	+ 18.4	.....	g	S	
148	I	1923 Oct.	6.872	+ 27.1	.....	f	S	
148	I	1923 Oct.	6.915	+ 29.4	+ 20.4	g	S	
148	I	1923 Oct.	6.959	+ 26.8	.....	p	S	
148	I	1923 Oct.	7.803	+ 28.4	.....	g	S	
148	I	1923 Oct.	14.908	+ 38.4	+ 14.0	g	S	
148	I	1923 Oct.	20.907	+ 20.5	+ 13.6	g	S	
148	I	1923 Oct.	20.928	+ 25.7	+ 12.5	g	S	
148	I	1923 Oct.	21.786	+ 20.1	+ 20.8	g	S	
148	I	1923 Oct.	22.969	+ 26.1	+ 13.5	g	S	
148	I	1923 Oct.	22.990	+ 26.5	+ 22.4	g	S	
148	I	1923 Nov.	6.869	+ 42.3	.....	f	S	
148	I	1923 Nov.	10.783	+ 27.6	.....	p	S	

TABLE III—*Continued*

No.	Dis.	Date G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
148	I	1923 Nov. 11.867	+ 35.4	.....	f	S	
148	I	1923 Nov. 11.896	+ 34.3	+ 9.8	g	S	
148	I	1923 Nov. 11.919	+ 26.8	.....	p	S	
148	I	1923 Nov. 17.781	+ 36.7	+ 14.1	g	S	
148	I	1923 Dec. 2.782	+ 32.8	+ 14.8	g	S	
148	I	1923 Dec. 15.827	+ 40.3	+ 25.1	g	S	
148	I	1923 Dec. 25.761	+ 45.2	+ 17.4	g	S	
148	I	1924 Jan. 6.820	+ 48.0	+ 2.7	f	S	
149	I	1903 Nov. 17.699	+ 22.3	+ 14.9	g	A, L, S	
149	I	1903 Dec. 1.899	+ 16.8	+ 20.6	g	A, L, S	
149	I	1903 Dec. 27.738	+ 18.5	+ 18.6	vg	L, S	
149	I	1906 Feb. 12.538	+ 17.2	.....	g	L, S	
149	I	1907 Jan. 4.687	+ 7.9	.....	p	L, S	
149	I	1909 Nov. 8.944	− 14.3	.....	vp	S	
149	I	1909 Dec. 17.771	.....	+ 19.8	g	L	
149	I	1911 Nov. 12.865	+ 39.6	+ 27.9	g	S	
149	I	1911 Nov. 25.792	+ 33.5	+ 36.7	vg	S	
149	I	1911 Dec. 23.681	+ 40.1	.....	f	S	
149	I	1912 Oct. 18.957	+ 88.7	.....	vg	S	
149	I	1912 Dec. 23.725	+ 17.1	+ 38.5	g	S	
149	I	1922 Oct. 30.935	+ 71.7	− 12.1	g	S	
149	I	1922 Nov. 6.782	+ 39.0	+ 19.8	g	S	
149	I	1922 Dec. 8.683	+ 12.0	+ 29.0	p	S	
149	I	1922 Dec. 8.713	+ 82.6	.....	p	S	
149	I	1922 Dec. 8.738	+ 97.9	.....	p	S	
149	I	1922 Dec. 8.771	+ 58.0	− 38.5	vg	S	
149	I	1922 Dec. 8.804	+ 5.3	.....	vg	S	
149	I	1922 Dec. 8.838	+ 28.5	+ 27.8	vg	S	
149	I	1922 Dec. 8.918	+ 38.0	.....	f	S	
149	I	1922 Dec. 11.628	+ 20.9	.....	g	S	
149	I	1922 Dec. 11.787	− 6.8	.....	p	S	
149	I	1922 Dec. 18.788	+ 31.6	+ 18.1	vg	S	
149	I	1922 Dec. 18.870	+ 32.2	+ 38.9	f	S	
149	I	1922 Dec. 22.685	+ 16.6	− 10.5	vg	S	
149	I	1922 Dec. 22.731	+ 22.4	+ 10.9	vg	S	
149	I	1922 Dec. 25.585	+ 9.6	+ 18.9	g	S	
149	I	1922 Dec. 25.635	+ 30.2	+ 22.3	g	S	
149	I	1923 Jan. 15.584	+ 26.1	+ 28.5	vg	S	
149	I	1923 Jan. 15.607	+ 57.2	.....	vp	S	
149	I	1923 Jan. 15.659	+ 17.0	+ 35.9	vg	S	
149	I	1923 Jan. 22.552	.....	+ 18.7	f	S	
149	I	1923 Feb. 7.643	+ 17.6	.....	p	S	
149	I	1923 Feb. 8.605	+ 1.8	+ 33.9	g	S	
149	I	1923 Feb. 9.681	+ 31.5	+ 79.5	g	S	
149	I	1923 Feb. 9.728	− 10.7	+ 26.2	f	S	
149	I	1923 Feb. 16.538	+ 6.6	+ 17.6	g	S	
149	I	1923 Feb. 16.572	+ 16.3	+ 25.5	g	S	
149	I	1923 Feb. 17.528	+ 24.8	+ 9.6	g	S	
149	I	1923 Feb. 17.555	− 5.0	+ 25.8	g	S	
149	I	1923 Feb. 22.532	+ 26.8	+ 24.2	g	S	
149	I	1923 Feb. 22.564	+ 12.3	+ 27.0	g	S	
149	I	1923 Mar. 1.551	+ 35.7	.....	g	S	
149	I	1923 Mar. 1.582	− 22.4	+ 27.6	g	S	
149	I	1923 Mar. 2.541	+ 20.2	.....	g	S	
149	I	1923 Mar. 2.569	− 6.0	.....	g	S	

TABLE III—*Continued*

No.	Dis.	Date G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
149	I	1923 Mar. 7.576	− 28.5	+ 27.7	g	S	
149	I	1923 Mar. 7.606	− 8.3	+ 27.4	f	S	
149	I	1923 Mar. 16.546	+ 0.2	+ 31.3	g	S	
149	I	1923 Mar. 23.562	+ 8.0	+ 39.2	g	S	
149	I	1923 Mar. 26.546	+ 2.5	+ 29.3	g	S	
149	I	1923 Mar. 28.536	+ 21.6	+ 32.0	g	S	
149	I	1923 Mar. 30.540	+ 60.2	+ 25.1	g	S	
149	I	1923 Sep. 8.945	+ 8.1	.....	f	S	
149	I	1923 Sep. 11.915	+ 18.6	+ 27.0	g	S	
149	I	1923 Sep. 15.940	+ 44.4	.....	g	S	
149	I	1923 Sep. 18.911	+ 1.5	+ 27.4	g	S	
149	I	1923 Sep. 23.927	− 15.0	.....	g	S	
149	I	1923 Oct. 7.851	+ 66.8	.....	g	S	
149	I	1923 Oct. 14.943	+ 6.4	+ 21.4	g	S	
149	I	1923 Oct. 20.800	+ 24.6	.....	p	S	
149	I	1923 Oct. 21.942	+ 51.5	.....	g	S	
149	I	1923 Oct. 22.931	+ 60.8	.....	f	S	
149	I	1923 Nov. 6.905	+ 12.4	.....	p	S	
149	I	1923 Nov. 10.738	− 18.0	.....	p	S	
149	I	1923 Nov. 11.824	− 7.9	+ 23.1	g	S	
149	I	1923 Nov. 17.746	+ 48.1	+ 10.9	g	S	
149	I	1923 Dec. 2.831	− 3.4	+ 21.0	g	S	
149	I	1923 Dec. 15.874	+ 39.3	+ 17.6	g	S	
149	I	1924 Jan. 5.801	+ 37.1	.....	p	S	
149	I	1924 Jan. 6.774	+ 46.1	+ 29.6	g	S	
149	I	1924 Jan. 19.794	− 5.2	+ 32.1	f	S	
149	I	1924 Jan. 26.724	+ 11.2	+ 30.7	g	S	
150	I	1911 Nov. 18.792	+ 27.6	+ 13.7	g	S	
150	I	1918 Nov. 4.832	+ 11.2	.....	p	S	
150	I	1920 Mar. 1.618	+ 21.2	.....	g	S	
151	III	1901 Oct. 3.862	+ 18.8	.....	f	A, F	
151	III	1902 Oct. 23.990	+ 16.7	.....	g	A	
151	III	1902 Oct. 29.794	+ 18.3	.....	g	A	
151	III	1902 Oct. 29.823	+ 18.8	.....	g	A	
151	III	1902 Oct. 30.888	+ 22.4	.....	f	A, F	
151	I	1903 Sep. 25.939	+ 14.5	+ 22.9	vg	L	
151	I	1905 Jan. 21.675	+ 19.5	+ 8.6	g	L	
152	I	1905 Feb. 13.646	+ 32.0	.....	g	F	
152	I	1906 Jan. 26.664	+ 18.8	.....	f	F	
152	I	1906 Feb. 12.578	+130.2	.....	g	F	
152	I	1906 Feb. 16.538	− 33.5	.....	g	F	
152	I	1907 Nov. 30.860	− 37.8	.....	g	L	
153	I	1905 Feb. 6.631	+ 19.8	.....	g	S	
153	I	1905 Dec. 15.751	+ 28.9	.....	g	S	
153	I	1905 Dec. 25.726	− 5.9	.....	f	S	
153	I	1906 Jan. 26.624	+ 36.5	.....	g	S	
153	I	1906 Feb. 12.615	+ 8.9	.....	f	S	
153	I	1907 Feb. 16.576	+ 38.2	.....	g	S	
154	I	1911 Oct. 23.892	+ 31.4	+ 13.4	vg	L	
154	I	1911 Oct. 31.838	+ 18.9	+ 6.8	g	L	
154	I	1911 Nov. 7.840	+ 36.9	+ 16.2	vg	L	
154	I	1922 Oct. 9.774	+ 28.3	+ 29.4	f	S	
154	I	1922 Oct. 30.978	+ 25.8	.....	g	S	
154	I	1922 Nov. 6.819	+ 27.9	+ 31.6	g	S	
154	I	1922 Dec. 8.878	+ 27.2	+ 7.8	vg	S	

TABLE III—*Continued*

No.	Dis.	Date G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
155	III	1901 Sep. 20.926	+ 13.9	.....	g	A, F	
155	III	1901 Sep. 26.893	+ 19.5	.....	f	A	
155	III	1901 Oct. 17.808	+ 19.5	.....	g	A	
155	III	1901 Oct. 23.810	+ 19.2	.....	p	A	
155	III	1901 Oct. 31.850	+ 17.4	.....	g	A, F	
155	III	1902 Mar. 13.603	+ 18.4	.....	g	A	
155	III	1902 Apr. 9.574	+ 17.4	.....	g	A, F	
155	I	1905 Jan. 21.699	+ 23.1	+ 8.4	g	L	
155	I	1908 Jan. 20.648	+ 17.3	− 7.9	vg	L	
156	I	1910 Nov. 7.793	+ 25.9	+ 18.1	g	Ar	
156	I	1910 Nov. 28.793	+ 26.7	+ 11.4	p	Ar	
156	I	1911 Jan. 2.683	+ 25.8	.....	vp	Ar	
156	I	1911 Jan. 6.637	+ 25.0	+ 22.0	f	Ar	
156	I	1918 Oct. 18.960	+ 29.9	.....	f	S	
157	I	1917 Feb. 9.617	+ 12.9	+ 25.9	g	S	
157	I	1924 Oct. 22.896	+ 24.6	.....	f	S	
157	I	1924 Oct. 25.895	+ 34.0	.....	f	S	
157	I	1924 Oct. 26.869	+ 16.4	.....	g	S	
157	I	1924 Nov. 2.828	+ 29.3	+ 38.3	g	S	
158	I	1904 Nov. 25.829	− 10.3	.....	g	L	
158	I	1905 Nov. 10.838	− 33.5	.....	p	L	
158	I	1912 Dec. 10.748	+ 26.6	+ 16.2	p	L	
159	I	1904 Apr. 16.600	+ 14.2	+ 18.3	vg	L	
159	I	1904 Apr. 30.612	+ 5.4	.....	g	L	
159	I	1904 Nov. 25.921	− 9.0	.....	g	L	
159	I	1907 Jan. 25.801	+ 21.0	+ 11.1	vg	L	
159	I	1907 Feb. 22.760	+ 24.8	+ 16.4	vg	L	
159	I	1907 Oct. 22.862	− 5.2	− 6.0	vg	L	
160	I	1904 Nov. 18.942	+ 9.2	.....	p	Ar	
160	I	1904 Nov. 25.776	+ 8.3	.....	f	Ar	
160	I	1907 Feb. 2.727	+ 3.3	.....	f	Ar	
160	I	1917 Jan. 22.726	− 2.4	+ 19.1	g	S	
161	III	1902 Feb. 19.739	+ 18.5	.....	g	A	
161	I	1903 Dec. 1.929	+ 20.6	.....	g	A	
161	I	1903 Dec. 25.896	+ 14.6	− 2.4	vg	Ar	
161	I	1904 Nov. 25.881	+ 18.4	+ 14.6	p	Ar	
161	I	1907 Oct. 22.919	+ 5.9	+ 21.0	g	Ar	
161	I	1917 Jan. 15.738	+ 28.1	+ 23.4	g	S	
162	I	1915 Jan. 4.749	+ 27.3	.....	p	S	
162	I	1916 Jan. 3.731	+ 48.2	.....	f	S	
162	I	1916 Oct. 7.879	+ 40.8	.....	f	S	
162	I	1916 Oct. 13.894	+ 27.6	.....	f	S	
162	I	1916 Nov. 10.853	+ 26.4	.....	f	S	
163	I	1915 Jan. 8.714	+ 21.0	.....	g	W	
163	I	1915 Mar. 29.580	+ 18.8	.....	f	W	
163	I	1916 Dec. 1.762	+ 23.4	.....	g	W	
163	I	1918 Nov. 1.906	+ 24.0	+ 16.7	g	S	
164	III	1903 Jan. 22.856	+ 79.2	.....	p	A	
164	I	1903 Oct. 31.981	+ 21.4	.....	g	F, A	
164	I	1903 Nov. 7.920	+ 18.8	.....	g	F, A	
164	I	1903 Nov. 13.982	+ 13.2	.....	g	F, A	
164	I	1903 Nov. 14.897	+ 11.5	.....	g	F, A	
164	I	1903 Nov. 17.666	+ 5.6	.....	g	A	
164	I	1904 Jan. 23.699	+ 12.1	− 7.5	g	S	
164	I	1923 Feb. 22.598	+ 32.9	+ 29.1	g	S	

TABLE III—*Continued*

No.	Dis.	Date G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
165	I	1903 Nov. 7.981	+ 58.8	.....	f	S	
165	I	1903 Dec. 31.930	+ 63.1	+ 23.3	f	S	
165	I	1904 Jan. 23.779	+ 42.1	− 15.6	g	S	
165	I	1906 Feb. 26.703	+ 17.0	+ 25.9	g	S	
166	I	1903 Nov. 7.953	+ 2.8	.....	g	F, A	
166	I	1904 Jan. 23.741	+ 41.5	.....	g	F, A	
166	I	1904 Jan. 29.631	+ 27.9	.....	g	F, A	
167	I	1905 Nov. 13.940	+ 29.7	.....	g	L	
167	I	1905 Dec. 9.794	+ 35.2	.....	g	L	
167	I	1905 Dec. 25.779	+ 28.0	.....	g	L	
167	I	1908 Jan. 14.787	+ 19.8	.....	p	L	
168	I	1915 Mar. 26.639	− 17.1	.....	p	Bk	
168	I	1917 Jan. 1.641	+ 13.8	.....	f	Bk	
168	I	1917 Jan. 15.659	− 11.8	.....	f	Bk	
168	I	1917 Dec. 14.731	+ 30.2	.....	g	Bk	
168	I	1917 Dec. 21.710	+ 45.0	.....	g	Bk	
168	I	1918 Jan. 7.693	− 4.6	.....	f	Bk	
168	I	1918 Jan. 28.564	+ 15.3	.....	f	Bk	
169	I	1914 Dec. 21.740	+ 23.9	+ 12.7	g	S	
169	I	1916 Nov. 29.942	+ 31.5	.....	p	S	
169	I	1917 Feb. 5.664	+ 15.4	+ 14.0	g	S	
169	I	1918 Feb. 1.604	+ 14.2	+ 0.1	f	S	
170	I	1924 Nov. 19.872	+ 28.9	.....	vp	S	
170	I	1924 Nov. 30.806	+ 43.6	+ 26.3	g	S	
170	I	1924 Dec. 1.881	+ 18.6	.....	g	S	
171	I	1911 Nov. 18.876	+ 43.0	− 12.0	g	S	
171	I	1916 Jan. 17.665	+ 74.7	.....	f	S	
171	I	1916 Oct. 7.942	+ 54.0	.....	p	S	
171	I	1919 Oct. 6.942	+ 45.6	.....	f	S	
172	I	1905 Feb. 3.667	+ 22.3	.....	g	H	
172	I	1905 Feb. 6.653	+ 32.3	.....	g	H	
172	I	1905 Dec. 15.780	+ 40.2	.....	g	H	
172	I	1907 Feb. 16.600	+ 24.0	.....	g	H	
173	I	1908 Jan. 17.717	+ 58.4	.....	f	S	
173	I	1924 Oct. 22.942	+ 39.7	.....	f	S	
173	I	1924 Nov. 3.849	+ 10.6	.....	g	S	
174	III	1901 Oct. 31.899	+ 31.4	.....	f	A, F	
174	III	1901 Nov. 1.893	+ 35.6	.....	f	F	
174	III	1901 Nov. 7.875	+ 30.2	.....	f	A, F	
174	III	1903 Dec. 13.790	+ 29.8	.....	g	S, F	
174	I	1905 Jan. 21.710	+ 29.0	.....	g	L, Gr	
174	III	1907 Mar. 10.657	+ 31.5	.....	g	S, G	
174	III	1925 Mar. 14.065	+ 43.3	.....	g	S	
175	I	1903 Dec. 1.953	+ 24.4	− 11.0	g	L	
175	I	1903 Dec. 25.986	+ 32.4	− 3.7	g	L	
175	I	1906 Feb. 26.742	+ 6.1	+ 17.8	g	L	
175	I	1908 Jan. 24.727	+ 16.1	+ 7.1	g	L	
175	I	1909 Jan. 1.776	+ 21.0	.....	g	L	
175	I	1910 Oct. 10.958	+ 79.4	+ 44.2	g	L	
175	I	1910 Oct. 31.953	+ 28.5	.....	p	S	
175	I	1910 Dec. 2.671	+ 26.7	.....	p	S	
175	I	1910 Dec. 23.749	+ 30.5	+ 17.5	p	S	
175	I	1910 Dec. 29.761	+ 47.1	+ 18.9	f	S	
176	I	1904 Dec. 30.746	+ 26.6	.....	g	L	
176	I	1905 Jan. 9.746	+ 31.6	.....	g	L	

TABLE III—*Continued*

No.	Dis.	Date G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
176	I	1908 Feb. 3.664	+ 14.8	.....	g	L	
177	I	1918 Feb. 22.558	+ 14.9	+ 39.5	g	S	
177	I	1920 Oct. 11.931	+ 14.1	.....	g	S	
177	I	1924 Oct. 19.965	− 2.2	.....	g	S	
178	I	1905 Nov. 13.885	+ 33.8	.....	g	S	
179	I	1904 Dec. 20.806	+ 20.1	.....	g	S	
179	I	1924 Oct. 19.937	+ 25.1	.....	f	S	
180	I	1905 Feb. 6.681	+ 34.0	.....	g	Gr, I	
180	I	1905 Mar. 3.613	+ 29.5	.....	f	I	
180	I	1905 Dec. 11.840	+ 19.4	.....	f	I	
180	I	1906 Dec. 14.730	+ 20.3	.....	g	I	
180	I	1906 Dec. 17.753	+ 37.2	.....	f	I	
181	I	1904 Dec. 20.860	+ 48.7	.....	f	S	
181	I	1905 Nov. 10.894	+ 35.1	.....	f	S	
181	I	1916 Oct. 16.927	+ 40.9	.....	p	S	
181	I	1916 Nov. 13.842	+ 48.5	.....	g	S	
182	I	1917 Oct. 15.937	+ 16.8	.....	vp	W	
182	I	1917 Nov. 2.871	+ 23.0	.....	p	W	
182	I	1917 Nov. 9.862	+ 36.5	.....	p	W	
182	I	1917 Nov. 23.819	+ 40.5	.....	p	W	
182	I	1917 Dec. 10.788	+ 36.1	+ 23.2	p	W	
183	I	1905 Apr. 7.660	+ 15.6	.....	g	S	
183	I	1906 Apr. 6.665	+ 4.9	.....	g	S	
183	I	1919 Nov. 17.955	+ 21.0	+ 31.9	g	S	
183	I	1919 Nov. 24.912	+ 17.0	+ 28.0	g	S	
184	III	1902 Jan. 8.844	+ 33.6	.....	g	A	
184	III	1902 Jan. 16.653	+ 35.8	.....	g	A, F	
184	III	1903 Apr. 16.630	+ 40.4	.....	g	A	
184	I	1903 Nov. 14.974	+ 16.7	.....	g	A	
184	I	1903 Dec. 27.649	+ 17.5	.....	g	A	
185	III	1903 Feb. 18.807	+ 0.8	.....	g	A	
185	I	1903 Dec. 26.966	+ 4.2	.....	g	L	
185	I	1903 Dec. 31.977	− 0.6	+ 11.9	g	L	
185	I	1904 Jan. 23.820	− 17.9	+ 12.0	g	L	
185	I	1905 Nov. 10.947	+ 10.5	.....	p	L	
185	I	1907 Jan. 25.919	− 16.6	.....	f	L	
186	I	1917 Feb. 2.646	+ 33.1	.....	g	S	
186	I	1924 Nov. 3.980	+ 9.6	.....	g	S	
186	I	1924 Nov. 15.872	+ 20.5	.....	g	S	
187	I	1915 Mar. 23.644	− 20.3	+ 19.1	g	S	
187	I	1915 Dec. 7.853	+ 4.0	+ 5.9	f	S	
187	I	1915 Dec. 13.948	+ 4.6	+ 7.1	f	S	
187	I	1917 Nov. 16.814	+ 7.9	+ 16.9	g	S	
188	I	1917 Feb. 21.599	− 42.1	.....	g	S	
188	I	1924 Nov. 9.922	− 11.5	.....	f	S	
188	I	1924 Nov. 30.899	+ 12.3	.....	g	S	
189	I	1905 Feb. 6.715	+ 15.9	.....	g	H, Mi, I	
189	I	1906 Jan. 26.702	+ 28.7	.....	g	H, I	
189	I	1906 Feb. 16.579	+ 24.3	.....	g	L	
189	I	1906 Feb. 26.580	+ 27.0	.....	g	H, I	
189	I	1908 Dec. 21.803	+ 30.3	.....	g	L	
190	I	1911 Oct. 23.971	+ 39.7	+ 30.9	g	S	
190	I	1916 Nov. 13.912	+ 42.0	+ 31.2	g	S	
190	I	1916 Dec. 15.814	+ 40.0	.....	f	S	
190	I	1916 Dec. 22.777	+ 45.7	.....	f	S	

TABLE III—*Continued*

No.	Dis.	D. te G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
191	III	1901 Nov. 7.910	+ 26.7	.....	g	A	
191	III	1902 Nov. 6.908	+ 25.1	.....	g	F, A	
191	III	1902 Nov. 19.875	+ 28.7	.....	f	F	
191	III	1903 Dec. 13.826	+ 25.8	.....	g	H, I	
191	III	1905 Jan. 16.732	+ 25.2	.....	f	H	
191	I	1912 Feb. 5.687	+ 28.3	.....	g	S	
191	I	1912 Feb. 5.696	+ 26.3	.....	g	S	
192	I	1915 Mar. 2.682	+ 24.3	.....	f	S	
192	I	1915 Dec. 28.812	+ 18.1	.....	g	S	
192	I	1916 Jan. 7.778	+ 8.3	.....	g	S	
192	I	1916 Jan. 17.622	+ 23.3	.....	f	S	
192	I	1916 Jan. 18.706	+ 44.4	.....	g	S	
192	I	1916 Jan. 22.722	+ 31.2	+ 25.8	f	S	
192	I	1916 Mar. 20.606	+ 26.9	.....	g	S	
193	III	1903 Feb. 5.665	+ 45.3	.....	f	A, H	
193	III	1903 Mar. 13.556	+ 49.0	.....	g	A, Mi, H	
193	I	1905 Mar. 3.650	+ 48.8	.....	f	H, I	
193	I	1906 Oct. 31.921	+ 49.2	+ 50.3	g	H, I	
193	I	1906 Nov. 4.983	+ 54.2	.....	g	I, H	
193	I	1906 Dec. 14.769	+ 49.7	.....	f	H	
193	I	1907 Nov. 25.899	+ 48.1	.....	g	H	
193	I	1908 Jan. 17.777	+ 52.4	.....	g	H	
194	I	1904 Nov. 1.960	+ 44.8	.....	p	L	
194	I	1904 Nov. 8.934	+ 32.3	.....	g	L	
194	I	1905 Dec. 11.802	+ 32.7	.....	g	L	
194	I	1908 Dec. 25.778	+ 31.8	.....	g	L	
194	I	1918 Feb. 22.606	+ 28.2	+ 40.0	f	S	
195	I	1907 Feb. 16.643	+ 45.6	.....	f	Ar	
195	I	1907 Feb. 22.644	+ 40.3	.....	f	Ar	
195	I	1916 Oct. 16.973	+ 21.1	.....	f	S	
196	I	1903 Dec. 1.847	+ 13.5	.....	g	A	+ 15.6 br.
196	I	1904 Jan. 2.790	+ 25.2	.....	g	A	+ 38.2 br.
196	I	1906 Feb. 26.619	+ 10.3	.....	g	S	
196	I	1907 Feb. 16.622	+ 18.8	.....	g	S	
196	I	1907 Nov. 25.939	+ 25.2	.....	p	S	
196	I	1908 Dec. 25.786	+ 32.0	.....	g	S	
197	I	1906 Jan. 26.742	−164.2	.....	g	F	
197	I	1906 Jan. 29.744	− 2.2	.....	g	F	
197	I	1906 Feb. 12.653	−238.5	.....	g	F	
197	I	1906 Feb. 16.622	− 88.2	.....	g	F	
198	I	1906 Mar. 23.597	+ 77.4	.....	p	L	
198	I	1906 Mar. 30.586	+ 49.4	.....	g	L	
198	I	1906 Apr. 2.562	+ 37.9	.....	g	L	
198	I	1907 Feb. 8.658	+ 0.4	.....	p	L	
198	I	1909 Mar. 1.661	+ 91.5	.....	g	L	
199	I	1917 Feb. 9.686	+ 33.2	+ 22.1	g	S	
199	I	1918 Mar. 15.617	+ 39.4	.....	f	S	
199	I	1924 Nov. 3.926	+ 23.8	+ 14.6	g	S	
200	III	1903 Jan. 16.768	+ 42.9	.....	f	H	
200	III	1903 Jan. 22.736	+ 40.4	.....	g	F, H	
200	III	1903 Feb. 5.729	+ 40.8	.....	g	A, H	
200	III	1903 Nov. 6.943	+ 46.9	.....	g	A, F, H	
200	III	1905 Jan. 16.776	+ 40.4	.....	g	H, G	
200	III	1907 Mar. 8.660	+ 40.5	.....	g	L, H, G	
201	I	1904 Nov. 11.969	+ 47.9	.....	g	S	

TABLE III—*Continued*

No.	Dis.	Date G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
201	I	1909 Dec. 29.716	+ 13.4	.....	f	S	
201	I	1910 Dec. 16.778	− 1.3	.....	p	S	
201	I	1910 Dec. 23.785	+ 44.2	.....	p	S	
201	I	1911 Jan. 2.830	+ 20.7	.....	f	S	
201	I	1911 Feb. 24.664	+ 53.2	.....	g	S	
201	I	1911 Nov. 26.815	+ 15.6	.....	g	S	
202	I	1910 Jan. 14.769	+ 32.2	+ 26.7	g	L	
202	I	1910 Nov. 28.912	+ 48.3	.....	p	L	
202	I	1912 Mar. 8.647	+ 38.3	+ 31.0	g	L	
202	I	1915 Dec. 7.920	+ 48.8	+ 35.5	f	S	
202	I	1917 Dec. 28.784	+ 37.7	+ 36.3	g	S	
203	I	1906 Feb. 16.665	− 34.7	.....	g	S	
203	I	1906 Feb. 16.692	− 25.4	.....	g	S	
203	I	1906 Feb. 26.654	− 23.3	.....	g	S	
203	I	1915 Feb. 16.678	− 51.5	.....	p	S	
203	I	1923 Jan. 22.773	− 7.7	.....	g	S	
204	I	1904 Nov. 15.971	+ 13.4	.....	p	Ar	
204	I	1905 Feb. 6.751	− 4.4	.....	g	S	− 47.9, + 38.1
204	I	1906 Mar. 5.678	+ 28.8	.....	g	S	
204	I	1908 Nov. 30.932	+ 11.3	.....	p	Ar	
204	I	1918 Feb. 4.678	+ 26.9	.....	f	S	− 32.7, + 69.0
204	I	1919 Nov. 14.862	+ 11.3	.....	g	S	
204	I	1920 Dec. 27.802	− 0.9	.....	f	S	
204	I	1925 Jan. 21.260	+ 22.7	.....	f	S	
204	I	1925 Jan. 23.261	+ 22.2	.....	g	S	
204	I	1925 Feb. 12.228	+ 16.4	.....	g	S	
205	III	1903 Jan. 22.949	+ 54.2	.....	f	F	
205	III	1903 Feb. 4.706	+ 5.6	.....	g	F, A	
205	III	1903 Feb. 13.736	+ 45.1	.....	p	F	
205	III	1903 Mar. 12.720	+ 14.4	.....	f	F, A	
205	I	1903 Dec. 1.972	+ 6.4	.....	g	F, A	
205	I	1903 Dec. 25.974	+ 26.3	.....	g	F, A	
205	I	1904 Dec. 30.797	+ 14.8	.....	g	S	
206	I	1906 Apr. 2.638	+ 6.5	.....	g	L	
206	I	1907 Feb. 22.703	+ 8.8	.....	g	L	
206	I	1924 Oct. 22.985	+ 14.3	.....	g	S	
207	I	1910 Nov. 7.900	+ 38.3	.....	f	S	
207	I	1910 Dec. 19.875	+ 41.6	.....	f	S	
207	I	1913 Dec. 18.827	+ 39.6	+ 37.9	f	S	
207	I	1916 Mar. 20.666	+ 29.7	.....	g	S	
207	I	1916 Apr. 17.572	+ 26.2	+ 17.3	g	S	
208	I	1904 Jan. 2.947	+ 1.0	− 2.3	g	A, F	
208	I	1904 Jan. 23.864	+ 86.4	.....	p	F, A	
208	I	1904 Feb. 26.776	+ 32.8	.....	g	F, A	
208	I	1904 Mar. 8.775	+ 80.9	+ 71.8	g	F, A	
208	I	1904 Apr. 15.642	+ 67.1	.....	g	F, A	
208	I	1904 Apr. 30.660	+ 26.5	.....	g	I	
208	I	1904 Dec. 30.846	− 34.3	.....	g	I	
208	I	1905 Jan. 9.875	+ 83.3	.....	g	I	
208	I	1905 Feb. 3.777	+ 74.6	.....	g	I	
208	I	1905 Dec. 9.841	+ 41.4	.....	g	I	
208	I	1905 Dec. 11.879	− 49.3	.....	g	I	
208	I	1905 Dec. 25.838	+ 39.1	.....	g	I	
208	I	1906 Jan. 26.788	+ 33.0	.....	g	I	
208	I	1906 Mar. 23.666	− 57.9	.....	g	I	

TABLE III—*Continued*

No.	Dis.	Date G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
208	I	1906 Apr. 20.585	+ 58.3	.....	g	I	
208	I	1900 Apr. 23.593	− 7.9	.....	f	I	
208	I	1906 Apr. 27.594	+ 91.2	.....	p	I	
208	I	1906 Oct. 31.982	+ 18.5	.....	p	I	
208	I	1907 Jan. 21.888	+ 88.1	+100.4	g	I	
208	I	1907 Feb. 22.812	+ 76.7	+ 77.9	g	I	
208	I	1907 Apr. 13.717	+ 69.4	.....	g	I	
208	I	1907 Apr. 20.653	+ 74.3	.....	p	I	
208	I	1907 Apr. 26.623	+ 68.7	+ 65.8	g	I	
208	I	1907 May 10.601	+ 81.3	.....	p	I	
208	I	1923 Jan. 15.886	+ 38.0	+ 48.3	g	S	
208	I	1923 Jan. 22.809	− 2.5	− 5.6	g	S	
209	I	1914 Feb. 13.701	+ 15.8	.....	f	S	
209	I	1916 Mar. 3.755	+ 9.3	.....	g	S	
209	I	1916 Apr. 4.654	+ 6.3	.....	g	S	
209	I	1916 Nov. 13.974	+ 33.7	.....	p	S	
209	I	1917 Jan. 1.876	+ 50.4	.....	g	S	
210	I	1914 Dec. 22.843	+ 37.7	.....	g	S	
210	I	1914 Dec. 25.827	+ 28.8	.....	f	S	
210	I	1915 Jan. 8.874	+ 7.8	.....	p	S	
210	I	1915 Feb. 9.667	+ 21.9	.....	g	S	
210	I	1915 Apr. 12.625	+ 16.8	.....	f	S	
211	I	1916 Jan. 31.803	+ 8.7	.....	g	S	
211	I	1917 Feb. 21.706	− 2.9	− 8.6	g	S	
211	I	1917 Feb. 26.690	+ 15.7	− 8.9	g	S	
211	I	1918 Apr. 8.625	+ 16.4	.....	g	S	
212	I	1912 Feb. 8.776	+ 44.0	.....	g	S	
212	I	1913 Dec. 29.839	+ 27.2	.....	f	S	
212	I	1915 Nov. 8.970	+ 4.9	.....	p	S	
212	I	1916 Jan. 23.860	+ 18.1	.....	f	S	
212	I	1916 Apr. 24.585	+ 25.8	.....	f	S	
213	I	1913 Dec. 17.882	+ 54.9	.....	f	S	
213	I	1913 Dec. 29.883	+ 22.4	+ 14.9	g	S	
213	I	1914 Mar. 20.608	+ 52.4	.....	f	S	
213	I	1914 May 1.581	+ 11.6	.....	g	S	
213	I	1916 Nov. 30.006	+ 27.6	.....	g	S	
213	I	1925 May 10.588	+ 55.4	.....	g	S	
214	III	1901 Nov. 8.887	+ 7.1	.....	f	S	
214	I	1906 Jan. 29.785	+ 7.1	.....	f	S	
214	I	1909 Dec. 22.883	− 14.7	.....	vp	Ar	
214	I	1910 Jan. 3.923	− 12.5	.....	g	Ar	
214	I	1917 Feb. 23.719	+ 5.7	.....	g	S	
214	I	1917 Mar. 28.722	+ 10.2	− 34.8	f	S	
214	I	1917 May 28.594	+ 18.9	.....	g	S	
215	I	1911 Nov. 26.976	+ 42.9	+ 22.8	g	S	
215	I	1911 Nov. 28.978	+ 35.2	.....	f	S	
215	I	1911 Dec. 4.991	+ 40.2	.....	g	S	
215	I	1911 Dec. 23.971	+ 37.9	.....	g	S	
215	I	1913 Mar. 5.697	+ 6.2	.....	g	S	
215	I	1916 Dec. 1.932	+ 20.9	.....	g	S	
215	I	1917 Jan. 15.865	+ 33.1	+ 43.3	g	S	
215	I	1917 Jan. 19.844	+ 18.9	.....	g	S	
215	I	1917 Jan. 22.762	+ 15.6	.....	f	S	
216	I	1911 Feb. 20.812	+ 19.3	+ 11.1	g	L	
216	I	1911 Nov. 12.953	+ 10.7	.....	f	L	

TABLE III—*Continued*

No.	Dis.	Date G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
216	I	1912 Apr. 26.608	− 0.6	.....	g	L	
216	I	1917 Feb. 23.776	+ 13.4	.....	g	S	
216	I	1917 Mar. 28.669	+ 6.0	.....	f	S	
216	I	1918 Dec. 10.503	+ 27.8	+ 10.7	g	S	
217	I	1916 May 8.612	− 17.8	.....	p	S	
217	I	1918 Jan. 7.869	+ 44.0	.....	g	S	
217	I	1920 Jan. 30.762	+ 33.3	.....	f	S	
218	III	1903 Mar. 13.720	+ 33.3	.....	f	A	
218	III	1903 Apr. 3.719	+ 35.4	.....	f	F, A	
218	III	1913 Apr. 8.733	+ 34.0	.....	g	A	
218	I	1904 Jan. 30.864	+ 39.1	+ 4.1	f	S	
218	I	1904 Nov. 25.971	+ 45.9	.....	g	S	
218	III	1909 Apr. 27.606	+ 38.0	.....	g	L	
218	I	1921 Feb. 21.803	+ 33.2	.....	g	S	
219	I	1924 Nov. 19.976	+ 74.0	.....	f	S	
219	I	1924 Nov. 29.934	+ 10.6	.....	g	S	
220	I	1917 Dec. 14.947	− 24.0	.....	p	S	
220	I	1917 Dec. 21.928	− 21.4	.....	f	S	
220	I	1918 Jan. 18.912	− 13.8	.....	g	S	
220	I	1919 Jan. 31.868	+ 1.8	.....	f	S	
221	I	1911 Jan. 27.846	+ 26.4	.....	g	S	
221	I	1912 Dec. 6.952	+ 4.2	.....	f	S	
221	I	1915 Dec. 28.942	+ 31.0	.....	g	S	
221	I	1916 Jan. 18.945	+ 35.1	.....	f	S	
222	I	1915 Mar. 9.859	+ 79.2	.....	f	S	
222	I	1915 Mar. 16.774	− 5.5	.....	g	S	
222	I	1915 Mar. 23.710	− 59.0	.....	f	S	
222	I	1918 Jan. 18.907	+ 98.0	.....	g	S	
223	III	1902 Apr. 2.688	− 8.1	.....	f	A	
223	III	1902 Apr 2.688	− 4.7	.....	f	F	
223	III	1902 Apr. 3.688	− 7.3	.....	p	A	
223	III	1902 Apr. 3.688	− 5.5	.....	p	F	
223	III	1902 Apr. 16.760	+ 0.4	.....	f	S	
223	III	1902 Apr. 19.710	− 8.9	.....	g	A	
223	III	1902 Apr. 19.710	− 3.0	.....	g	F	
223	III	1903 Feb. 18.896	− 2.1	.....	g	A	
223	I	1904 May 10.602	+ 1.8	.....	g	S	
224	III	1902 Feb. 3.824	− 28.6	.....	g	S	
224	III	1902 Sep. 13.597	+ 4.7	.....	f	S	
224	I	1904 Jan. 23.919	− 7.1	.....	g	S	
224	I	1904 Dec. 30.924	− 23.5	.....	g	S	
224	I	1911 Jan. 2.925	− 27.0	.....	g	S	
224	I	1919 Dec. 29.978	− 7.5	.....	g	S	
224	I	1920 Jan. 9.592	− 7.2	.....	g	S	
224	I	1920 Feb. 20.919	− 18.0	.....	g	S	
224	I	1920 Apr. 5.747	− 23.6	.....	g	S	
224	I	1925 Feb. 12.155	− 3.6	.....	g	S	
224	I	1925 Feb. 12.189	− 2.9	.....	g	S	
225	I	1913 Dec. 8.994	− 2.6	− 46.7	g	S	
225	I	1914 Mar. 17.758	+ 15.2	− 11.0	f	S	
225	I	1914 Apr. 6.722	+ 21.2	+ 35.8	g	S	
225	I	1917 Dec. 28.946	− 0.4	− 64.1	f	S	
226	I	1915 Jan. 26.843	+ 54.9	.....	g	S	
226	I	1915 Jan. 26.869	+ 22.2	.....	g	S	
226	I	1917 Dec. 29.015	− 9.5	.....	f	S	

TABLE III—*Continued*

No.	Dis.	Date G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
226	I	1918 Mar. 11.749	+ 96.6	.....	p	S	
226	I	1918 May 20.576	− 40.0	.....	g	S	
226	I	1919 Jan. 24.512	+ 14.6	.....	g	S	
226	I	1919 Jan. 24.526	+ 23.7	.....	g	S	
226	I	1923 June 18.623	− 73.1	.....	f	S	
227	III	1901 Dec. 31.939	+ 12.8	.....	g	L	
227	III	1902 Apr. 19.788	+ 10.0	.....	vg	L	
227	I	1904 Jan. 23.941	− 17.7	.....	vg	L	
227	I	1908 Dec. 22.017	− 20.3	.....	vg	L	
227	I	1909 May 7.609	− 15.4	.....	g	L	
227	I	1909 May 17.653	− 9.7	.....	vg	L	
227	I	1909 May 28.593	− 11.4	.....	vg	L	
227	I	1909 May 31.846	− 19.3	.....	g	L	
227	I	1910 Jan. 14.883	− 11.6	− 7.3	g	L	
227	I	1910 Mar. 25.770	+ 0.1	.....	g	L	
227	I	1910 May 13.782	− 11.7	.....	g	S	
227	I	1910 May 20.792	− 31.0	.....	f	S	
227	I	1918 Jan. 8.031	− 13.2	.....	g	S	
227	I	1918 Jan. 8.035	+ 0.9	.....	g	S	
227	I	1918 Jan. 8.041	− 4.6	.....	g	S	
227	I	1918 Jan. 19.023	− 18.5	.....	g	S	
227	I	1918 Jan. 19.027	− 10.0	.....	f	S	
227	I	1923 Dec. 16.026	− 14.0	.....	p	S	
227	I	1923 Dec. 16.031	− 22.0	.....	p	S	
228	I	1917 May 23.649	− 40.6	.....	f	S	
228	I	1925 Jan. 8.501	− 3.0	.....	p	S	
228	I	1925 Feb. 12.459	− 23.7	.....	g	S	
229	I	1914 Mar. 11.867	− 12.3	− 32.3	g	W	
229	I	1914 Mar. 23.891	− 29.5	− 42.0	p	W	
229	I	1914 May 1.742	− 31.8	− 44.9	f	W	
229	I	1918 Apr. 8.722	− 28.8	.....	vp	W	
229	I	1918 May 22.677	− 46.7	.....	p	W	
229	I	1919 Jan. 31.984	− 4.5	− 12.6	f	W	
229	I	1919 Apr. 25.732	− 14.8	− 13.7	f	W	
230	III	1902 May 14.719	− 22.7	.....	g	L	
230	I	1904 May 10.624	− 18.1	.....	vg	L	
230	I	1904 May 21.632	− 39.9	.....	vg	L	
230	I	1910 Mar. 14.876	− 29.4	.....	vg	L	
230	I	1910 May 20.827	− 65.1	.....	g	L	
230	I	1910 May 31.803	− 52.5	.....	g	L	
230	I	1911 Mar. 3.974	− 15.2	.....	vg	L	
231	I	1912 Jan. 23.992	+ 53.0	.....	g	S	
231	I	1912 Mar. 15.867	+ 2.4	.....	g	S	− 83.1, + 88.0
231	I	1912 Apr. 26.710	+ 70.8	.....	g	S	
231	I	1915 Feb. 9.939	+ 94.3	.....	f	S	
231	I	1915 Mar. 22.837	− 2.6	.....	g	S	
232	I	1917 Mar. 23.890	+ 29.2	.....	f	S	
232	I	1925 Feb. 15.466	+ 32.2	.....	f	S	
232	I	1925 May 6.826	+ 18.8	.....	f	S	
233	I	1904 Jan. 30.908	− 20.9	.....	f	S	
233	I	1904 Mar. 8.838	− 18.9	.....	g	S	
233	I	1904 Apr. 15.683	− 68.6	.....	p	S	
233	I	1917 Apr. 11.792	− 6.1	.....	f	S	
233	I	1918 May 20.615	+ 4.9	.....	f	S	
234	I	1904 Apr. 30.714	− 0.1	.....	g	I	

TABLE III—*Continued*

No.	Dis.	Date G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
234	I	1904 May 10.654	+ 1.4	.....	f	Ar, I	
234	I	1904 May 21.681	+ 0.3	.....	p	I	
234	I	1906 Mar. 30.907	+ 5.4	.....	f	Ar, I	
235	I	1904 Apr. 30.760	− 3.2	.....	vg	L	
235	I	1904 May 10.705	+103.1	.....	g	L	
235	I	1904 May 14.800	− 7.4	.....	vg	L	
235	I	1904 June 11.662	− 19.1	.....	vg	L	
236	I	1910 Mar. 7.875	+ 6.9	.....	f	S	
236	I	1910 Mar. 14.940	− 6.5	.....	g	S	
236	I	1911 Jan. 23.992	+ 13.5	.....	g	S	
236	I	1920 June 11.734	− 2.0	.....	p	S	
236	I	1921 May 6.731	− 21.0	.....	f	S	
236	I	1921 May 20.658	− 8.3	.....	f	S	
237	I	1917 May 2.730	+ 5.5	.....	f	S	
238	I	1914 Jan. 23.972	+ 20.0	.....	p	S	
239	I	1914 Mar. 11.922	+ 22.3	− 13.5	f	S	
239	I	1915 Mar. 8.944	− 7.0	− 10.6	g	S	
239	I	1917 Feb. 21.974	− 22.7	− 6.7	f	S	
240	I	1915 Mar. 29.907	+ 2.9	.....	g	W	
240	I	1915 Mar. 30.954	− 12.9	.....	g	W	
240	I	1915 Apr. 2.876	− 10.7	.....	g	W	
240	I	1915 Apr. 5.851	− 20.1	− 7.2	g	W	
241	III	1902 May 16.751	+ 98.1	.....	f	A	
241	III	1902 June 6.735	− 89.0	.....	f	A	
241	III	1902 June 20.742	− 40.5	.....	f	A	
241	III	1902 June 25.716	−123.8	.....	f	A	
241	III	1902 July 3.651	−114.2	.....	f	A	
241	III	1902 July 7.656	+113.7	.....	f	A	
241	I	1923 June 1.712	+ 8.9	.....	g	S	
242	III	1902 May 7.797	− 17.9	.....	p	S	
242	III	1903 Apr. 8.868	− 28.4	.....	g	S	
242	I	1903 June 5.738	− 42.2	.....	g	A, L	
242	I	1903 June 6.692	− 42.2	.....	p	A, L	
242	I	1904 Mar. 19.922	+ 14.0	.....	g	A, L	
242	I	1909 May 17.757	− 30.3	.....	f	L	
242	I	1909 June 4.712	− 23.3	.....	f	S	
242	I	1909 June 11.707	+ 16.6	.....	p	L	
243	I	1910 Jan. 14.984	− 1.4	+ 12.3	vg	L	
243	I	1910 Jan. 18.997	− 10.2	.....	g	L	
243	I	1910 June 13.659	− 0.7	− 6.5	g	L	
243	I	1917 Mar. 21.955	− 9.3	.....	p	S	
243	I	1917 Apr. 27.753	+ 11.8	.....	p	S	
244	III	1902 Apr. 16.885	− 8.7	.....	p	A	
244	III	1903 Apr. 16.822	+ 19.4	.....	g	A	
244	I	1903 June 5.726	− 99.8	.....	g	A	
244	I	1903 June 12.703	− 98.1	.....	g	A	
245	I	1904 Mar. 19.943	+ 3.7	.....	vg	L	
245	I	1904 Apr. 30.801	+ 6.8	.....	g	L	
245	I	1904 June 11.710	− 5.5	.....	vg	L	
246	I	1903 May 10.606	− 13.2	.....	g	A	
246	I	1903 May 16.837	− 15.7	.....	g	A	
246	I	1905 June 23.793	− 11.8	.....	g	Mi	
246	I	1907 Aug. 10.617	− 16.9	.....	g	Mi	
246	I	1908 Apr. 13.892	− 12.3	.....	p	Mi	
246	I	1910 Mar. 18.914	− 23.4	− 24.3	g	S	

TABLE III—*Continued*

No.	Dis.	Date G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
247	I	1915 June 25.651	− 7.4	.....	p	W	
247	I	1915 July 2.639	− 9.7	.....	f	W	
247	I	1917 June 15.672	+ 2.3	.....	f	W	
247	I	1918 June 7.713	− 9.1	.....	f	W	
247	I	1923 June 1.677	+ 10.1	.....	f	S	
248	I	1917 Feb. 19.969	− 4.5	− 32.4	g	S	
248	I	1918 June 7.637	+ 6.7	.....	f	S	
248	I	1920 Jan. 9.874	+ 3.5	.....	g	S	
249	I	1903 June 5.753	− 43.3	.....	vg	L	
249	I	1904 Apr. 15.814	− 40.9	.....	vg	L	
249	I	1904 Apr. 16.833	− 27.2	− 21.9	vg	L	
249	I	1911 June 29.701	− 22.0	.....	p	L	
250	III	1902 Feb. 19.898	− 12.0	.....	g	A	
250	III	1902 Mar. 12.923	− 10.1	.....	g	A	
250	III	1902 Mar. 13.817	− 11.1	.....	f	A, F	
250	III	1902 Apr. 3.728	− 11.5	.....	p	A, F	
250	III	1902 Apr. 10.819	− 14.9	.....	f	S	
250	I	1903 Oct. 17.508	− 12.5	− 13.7	vg	L	
250	I	1904 July 22.658	− 10.2	.....	p	L	
250	I	1905 June 16.656	− 21.6	.....	g	L	
250	I	1908 July 20.642	− 10.8	.....	vg	L	
251	I	1904 May 31.762	− 24.1	.....	f	S	
251	I	1904 June 10.719	− 13.5	.....	p	S	
251	I	1905 June 23.720	+ 12.0	.....	f	S	
252	I	1915 Mar. 30.897	− 16.6	.....	g	D	
252	I	1915 Apr. 2.917	+ 5.3	.....	g	D	
252	I	1915 Apr. 5.891	− 1.8	.....	g	D	
252	I	1915 June 8.706	− 9.5	.....	p	D	
253	I	1908 Mar. 23.765	− 14.0	− 62.3	g	S	
253	I	1909 Mar. 1.933	+ 4.8	.....	g	S	
253	I	1913 Jan. 21.988	− 12.9	+ 15.4	g	S	
253	I	1918 May 3.727	− 14.7	− 81.4	f	S	
254	I	1904 Apr. 15.832	+ 2.8	.....	vg	L	
254	I	1904 Apr. 16.853	+ 0.3	+ 0.1	g	S	
254	I	1904 Apr. 29.819	− 10.9	.....	vg	L	
254	I	1914 June 12.746	− 15.7	.....	g	D	
255	III	1902 July 16.708	− 44.1	.....	p	W	
255	I	1904 May 10.747	+ 38.5	− 13.3	p	W	
255	I	1909 May 17.770	− 1.7	.....	p	W	
255	I	1913 Feb. 8.010	− 51.6	− 2.7	f	W	
255	I	1917 Apr. 11.849	− 97.2	.....	p	W	
255	I	1918 Sep. 30.524	− 52.8	.....	f	W	
256	I	1915 Feb. 10.000	− 35.0	.....	f	S	
256	I	1915 Mar. 15.965	− 10.2	.....	g	S	
256	I	1915 Mar. 22.958	− 8.2	.....	g	S	
256	I	1917 Apr. 2.860	− 14.9	.....	f	S	
256	I	1917 Apr. 6.810	+ 0.1	− 0.9	g	S	
256	I	1917 Apr. 9.797	+ 0.5	.....	f	S	
257	III	1902 Feb. 3.933	− 13.1	.....	g	A, F	
257	III	1902 Feb. 10.925	− 12.8	.....	g	A, F	
257	III	1902 Feb. 19.856	− 12.6	.....	g	A, F	
257	III	1902 May 30.669	− 14.6	.....	f	A, F	
257	III	1909 Apr. 9.816	− 8.1	.....	g	S	
258	I	1903 Feb. 19.926	− 65.0	.....	g	A	
258	I	1903 Mar. 18.805	− 42.9	.....	g	A	

TABLE III—*Continued*

No.	Dis.	Date G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
258	I	1903 May 7.685	+ 99.7	.....	g	A	
258	I	1903 May 9.756	+ 98.4	.....	p	A	
258	I	1904 Jan. 30.949	− 37.8	.....	f	S	− 98.3,+ 22.6
258	I	1904 July 22.732	− 95.9	.....	g	S	
259	I	1904 Apr. 16.872	− 1.0	.....	vg	L	
259	I	1904 Apr. 29.844	+ 7.8	.....	vg	L	
259	I	1904 Apr. 30.838	+ 5.7	.....	vg	L	
259	I	1904 June 11.747	− 3.1	.....	vg	L	
260	I	1913 Apr. 7.899	+ 23.8	.....	g	S	− 19.8,+ 67.4
260	I	1913 June 27.638	− 5.9	.....	g	S	−107.1,+ 95.3
260	I	1918 Mar. 15.918	+ 3.2	.....	g	S	
260	I	1919 June 27.648	+ 16.1	.....	f	S	−105.0,+137.2
260	I	1925 May 11.306	+ 19.9	.....	f	S	
261	I	1909 July 16.663	− 21.5	.....	p	L	
261	I	1910 May 27.803	− 23.6	.....	g	L	
261	I	1917 Apr. 6.856	+ 6.4	.....	f	S	
261	I	1919 June 13.724	− 28.6	.....	g	S	
261	I	1919 June 16.758	− 25.4	.....	f	S	
261	I	1920 May 31.821	− 16.5	.....	g	S	
262	III	1901 Sep. 27.608	− 17.4	.....	g	A	
262	III	1901 Oct. 3.646	− 15.7	.....	g	A, F	
262	III	1901 Oct. 18.644	− 15.8	.....	p	A, F	
262	III	1902 Sep. 3.722	− 15.1	.....	g	S, A	
262	I	1903 May 7.648	− 16.9	.....	g	F	
262	I	1904 July 22.690	− 13.5	.....	g	S	
262	I	1906 Apr. 23.822	− 27.5	− 30.9	vg	L	
262	I	1909 May 7.711	− 23.2	.....	g	L	
262	I	1918 July 1.597	− 12.9	.....	g	D	
262	III	1925 Mar. 19.454	− 20.7	.....	g	S	
262	III	1925 Mar. 26.417	− 22.6	.....	g	S	
262	III	1925 Mar. 29.438	− 22.3	.....	g	S	
262	III	1925 Apr. 3.384	− 13.9	.....	f	S	
262	I	1925 May 7.393	− 14.9	− 19.5	g	S	
263	I	1903 July 4.713	− 16.4	.....	g	F, L, S	
263	I	1903 July 31.683	− 3.3	.....	g	L	− 91.2,+ 84.6
263	I	1913 Mar. 10.981	+ 4.3	.....	vg	L, S	
263	I	1913 Mar. 17.948	+ 25.2	.....	f	S, L	− 51.0,+101.4
263	I	1917 May 28.778	− 16.6	.....	f	S	
264	III	1902 May 14.801	+ 1.3	.....	p	Bk	
264	I	1903 Oct. 17.540	− 2.2	− 12.1	vg	L	
264	I	1906 Apr. 27.885	+ 0.3	− 7.4	g	L	
264	III	1906 May 18.797	− 1.1	.....	g	L	
264	I	1917 Mar. 28.957	+ 4.8	.....	vg	D	
265	I	1910 June 27.628	− 18.1	− 31.8	g	S	
265	I	1911 Apr. 24.841	− 22.0	− 17.0	g	S	
265	I	1911 May 8.875	− 11.2	.....	f	S	
265	I	1911 June 9.735	− 7.2	.....	g	S	
265	I	1911 June 12.774	− 19.1	− 18.9	g	S	
265	I	1911 June 13.738	− 9.9	− 21.3	g	S	
265	I	1911 June 19.715	− 6.7	− 14.8	g	S	
265	I	1911 June 23.690	− 13.4	.....	g	S	
265	I	1911 June 26.776	− 15.6	.....	f	S	
265	I	1911 June 29.776	− 20.0	.....	p	S	
266	III	1902 July 23.745	− 10.9	.....	f	A	
266	III	1902 Aug. 6.692	− 8.1	.....	p	S	

TABLE III—*Continued*

No.	Dis.	Date	G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
266	III	1902 Aug.	11.675	− 12.1	.....	g	A, F	
266	III	1902 Aug.	27.625	− 8.1	.....	g	A	
266	III	1902 Sep.	3.632	− 9.1	.....	g	A	
266	I	1903 Oct.	17.571	− 18.5	− 23.6	vg	L	
266	I	1904 July	26.717	− 16.9	− 16.0	g	L	
266	I	1908 July	20.677	− 17.3	.....	vg	L	
266	I	1908 July	24.767	− 18.3	− 21.5	vg	L	
267	I	1904 Apr.	15.858	+ 45.8	.....	g	F, A	
267	I	1904 Apr.	16.900	+ 42.0	.....	g	F, A	
267	I	1904 Apr.	29.874	− 34.1	.....	g	A	
267	I	1904 Apr.	30.878	− 32.8	.....	f	F	
267	I	1906 June	1.845	− 55.8	.....	g	I	
267	I	1906 July	9.706	− 18.4	.....	g	I	
267	I	1906 July	20.640	− 8.9	.....	g	I	
267	I	1906 July	27.621	− 2.8	.....	g	I	
267	I	1906 Aug.	10.622	+ 11.3	.....	vg	I	
267	I	1906 Aug.	20.615	+ 31.1	.....	g	I	
267	I	1906 Sep.	5.582	+ 43.3	.....	g	I	
267	I	1906 Sep.	10.594	+ 39.0	.....	vg	I	
267	I	1906 Sep.	21.585	+ 64.3	.....	vg	I	
267	I	1906 Oct.	1.565	+ 57.1	.....	g	I	
267	I	1906 Oct.	19.523	− 40.7	.....	vg	I	
267	I	1907 Apr.	13.927	− 22.7	.....	g	I	
267	I	1907 Apr.	19.912	− 42.7	.....	p	I	
267	I	1907 Apr.	22.890	− 42.5	.....	p	I	
267	I	1907 Apr.	26.914	− 43.8	.....	p	I	
267	I	1907 Apr.	30.914	− 65.1	.....	g	I	
267	I	1907 May	10.908	− 64.0	.....	vg	I	
268	I	1919 Mar.	21.936	− 12.0	.....	g	S	
268	I	1919 Mar.	31.915	− 21.6	+ 47.2	g	S	
268	I	1919 May	9.806	− 0.3	.....	g	S	− 95.6, + 95.0
268	I	1919 May	12.796	− 11.2	+ 0.3	g	S	
268	I	1920 May	24.767	− 59.0	.....	f	S	
269	I	1913 July	7.660	− 12.3	.....	f	S	
269	I	1919 Apr.	25.851	− 7.2	− 13.8	g	S	
269	I	1920 June	7.749	− 16.5	− 19.8	g	S	
269	I	1920 June	11.869	− 12.6	.....	p	S	
270	I	1915 Mar.	22.912	− 27.5	− 34.3	g	W	
270	I	1915 Apr.	13.861	− 31.3	.....	f	W	
270	I	1915 May	18.824	− 15.4	− 12.8	vg	W	
271	I	1903 June	6.847	+ 20.8	.....	vp	L	
271	I	1904 June	11.783	− 2.6	.....	vg	L	
271	I	1908 Aug.	17.659	+ 38.0	.....	g	L	
271	I	1908 Aug.	21.579	+ 30.5	.....	vg	L	
271	I	1908 Aug.	24.588	+ 26.1	.....	vg	L	
271	I	1908 Aug.	25.605	+ 32.3	.....	vg	L	
271	I	1908 Aug.	28.617	+ 35.0	.....	g	L	
271	I	1909 May	17.851	+ 17.8	.....	vg	L	
271	I	1910 July	19.693	+ 33.3	+ 18.4	vg	L	
271	I	1915 May	31.806	+ 8.2	.....	f	S	
272	I	1909 Aug.	20.619	− 41.4	.....	f	S, L	
272	I	1913 Apr.	18.910	− 28.6	.....	f	S, L	
272	I	1917 June	15.807	− 18.2	.....	f	S	
272	I	1918 June	7.868	− 5.0	.....	f	S	
273	I	1913 Apr.	28.888	− 18.7	+ 87.3	g	S	

TABLE III—*Continued*

No.	Dis.	Date G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
273	I	1913 May 23.806	− 29.5	.....	f	S	
273	I	1913 June 27.730	− 8.5	.....	p	S	
273	I	1913 July 4.678	− 21.1	.....	p	S	
273	I	1920 May 14.858	+ 5.6	− 29.3	g	S	
273	I	1921 Aug. 29.653	− 15.6	.....	p	S	
274	I	1915 Apr. 27.888	− 5.5	.....	f	S	
274	I	1925 May 10.383	+ 2.8	− 0.4	g	S	
274	I	1925 June 28.204	+ 3.2	.....	g	S	
275	III	1902 June 25.766	+ 0.6	.....	f	S	
275	I	1904 June 11.804	− 11.7	.....	g	S	
275	I	1921 June 13.777	− 9.2	− 66.4	g	S	
276	I	1904 Mar. 19.849	− 88.0	.....	g	F, A	
276	I	1904 Apr. 12.861	+ 32.8	.....	vp	F	
276	I	1904 Apr. 15.778	+ 7.2	.....	g	A, F	
276	I	1904 Apr. 16.792	+ 8.4	.....	g	A, F	
276	I	1904 Apr. 29.773	− 3.9	.....	g	F	
276	I	1904 Sep. 9.643	− 49.6	.....	g	L	
276	I	1906 July 20.828	+ 10.6	.....	g	L	
276	I	1907 June 29.726	− 4.6	.....	p	L	
277	I	1924 Aug. 2.651	− 17.9	.....	p	S	
277	I	1924 Nov. 16.483	− 17.8	.....	g	S	
277	I	1925 May 18.385	− 23.9	.....	g	S	
278	I	1925 July 2.190	− 5.8	.....	f	S	
278	I	1925 July 5.223	− 23.1	.....	f	S	
278	I	1925 July 6.228	+ 10.7	.....	f	S	
279	I	1913 Aug. 1.608	− 8.5	.....	g	F	
279	I	1914 June 16.742	− 20.2	.....	f	F, M	
279	I	1914 June 23.695	− 11.1	.....	g	F	
279	I	1914 Aug. 4.625	− 10.3	.....	p	F	
280	I	1915 May 11.873	− 9.1	.....	f	S	
280	I	1915 May 21.905	+ 10.8	.....	g	S	
280	I	1915 Oct. 1.540	− 4.7	.....	g	S	
280	I	1921 June 13.810	+ 2.1	.....	g	S	
280	I	1921 July 1.735	+ 14.3	.....	g	S	
280	I	1921 Aug. 12.680	− 19.7	.....	g	S	
280	I	1922 Mar. 10.988	− 12.7	.....	g	S	
281	I	1903 June 13.757	+ 13.2	.....	p	A, F	
281	I	1903 July 4.776	− 20.6	.....	g	A, F	
281	I	1903 Sep. 5.592	− 28.1	.....	g	A	
281	I	1903 Sep. 12.603	− 5.8	.....	g	A, F	
282	I	1909 Aug. 6.691	+ 7.3	.....	p	S	
282	I	1917 Nov. 9.564	− 37.9	.....	p	S	
282	I	1918 June 14.735	+ 5.5	.....	f	S	
282	I	1919 Apr. 18.907	− 10.0	.....	g	S	
283	I	1913 June 11.802	− 21.1	.....	g	S	
283	I	1919 May 9.892	+ 4.2	.....	f	S	
283	I	1924 Nov. 12.496	− 14.9	.....	g	S	
284	I	1910 July 8.693	− 4.6	− 14.0	g	L	
284	I	1910 July 18.714	− 3.2	− 4.8	g	L	
284	I	1910 July 19.729	− 2.7	− 10.7	vg	L	
285	III	1902 July 31.869	− 9.3	.....	f	A	
285	III	1902 Sep. 13.748	− 9.8	.....	p	A	
285	III	1902 Oct. 15.592	− 4.3	.....	f	A, F	
285	III	1902 Oct. 16.647	− 7.9	.....	p	A, F	
285	I	1903 Oct. 17.642	− 7.5	.....	vg	F	

TABLE III—*Continued*

No.	Dis.	Date G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
286	I	1909 July 16.743	− 19.8	.....	f	S	
286	I	1909 Oct. 29.503	− 29.6	.....	p	S	
286	I	1909 Nov. 8.607	− 31.3	.....	g	S	
286	I	1909 Nov. 25.499	− 32.1	.....	g	S	
286	I	1910 June 20.817	− 22.7	.....	g	S	
286	I	1910 Aug. 5.607	− 17.7	− 26.3	g	S	
286	I	1910 Aug. 25.629	− 34.1	.....	p	S	
286	I	1910 Oct. 17.594	− 27.3	.....	f	S	
286	I	1911 May 12.874	− 25.3	.....	p	S	
286	I	1911 July 7.774	− 13.2	.....	f	S	
286	I	1912 July 26.738	− 8.7	.....	f	S	
286	I	1913 June 13.791	− 16.4	.....	g	S	
286	I	1913 June 16.762	− 1.4	.....	f	S	
287	I	1909 Aug. 23.618	+ 28.5	.....	p	S	
287	I	1924 Nov. 19.505	+ 30.8	.....	f	S	
287	I	1924 Dec. 1.482	+ 9.1	.....	g	S	
288	I	1907 Sep. 24.590	+ 52.4	.....	vg	Ar	
288	I	1907 Oct. 18.518	+ 30.1	.....	vg	Ar	
288	I	1907 Oct. 20.553	+ 26.9	.....	vg	Ar	
288	I	1907 Oct. 22.545	+ 25.4	.....	f	Ar	
288	I	1908 July 20.781	+ 43.7	.....	p	Ar	
288	I	1908 July 31.731	+ 3.6	.....	vg	Ar	
288	I	1908 Aug. 7.609	− 7.7	.....	vg	Ar	
288	I	1908 Aug. 10.746	− 16.8	.....	vp	Ar	
288	I	1908 Aug. 17.700	− 32.1	.....	vg	Ar	
288	I	1908 Aug. 21.621	− 32.1	.....	vg	Ar	
288	I	1908 Aug. 24.623	− 29.6	.....	vp	Ar	
288	I	1908 Aug. 25.649	− 29.6	.....	p	Ar	
288	I	1908 Sep. 7.599	− 43.5	.....	p	Ar	
288	I	1908 Sep. 25.563	− 24.1	.....	f	Ar	
288	I	1908 Oct. 2.549	− 14.1	.....	g	Ar	
288	I	1909 May 17.888	− 19.3	.....	g	Ar	
288	I	1909 July 16.704	+ 3.8	.....	p	Ar	
288	I	1911 Apr. 24.908	− 35.5	− 26.3	vg	Ar	
288	I	1911 May 5.890	− 39.9	.....	g	Ar	
288	I	1911 June 9.854	+ 19.5	.....	vp	Ar	
288	I	1911 June 19.858	+ 40.1	+ 27.1	g	Ar	
288	I	1911 July 17.712	+ 58.9	.....	vg	Ar	
288	I	1911 July 24.702	+ 42.9	+ 45.4	p	Ar	
288	I	1911 Sep. 15.594	− 34.3	− 34.1	g	Ar	
289	I	1909 July 19.802	− 5.2	.....	f	W	
289	I	1916 Sep. 15.576	− 16.7	.....	f	W	
289	I	1916 Sep. 23.548	− 10.7	.....	f	W	
289	I	1920 June 25.741	− 41.6	.....	vp	S	
289	I	1920 July 19.719	− 24.0	.....	p	S	
289	I	1921 May 20.764	− 21.7	.....	vg	S	
289	I	1922 May 29.840	− 13.5	.....	f	S	
289	I	1922 May 29.899	+ 9.2	.....	g	S	
289	I	1922 June 5.756	− 15.7	.....	g	S	
289	I	1922 June 5.787	− 8.8	.....	p	S	
289	I	1922 June 5.833	− 10.0	.....	g	S	
289	I	1922 June 5.857	− 4.4	.....	g	S	
289	I	1922 June 5.887	− 7.2	.....	g	S	
290	I	1903 May 7.758	− 21.8	.....	g	A, F	
290	I	1903 May 8.774	− 18.0	.....	p	A, F	

TABLE III—*Continued*

No.	Dis.	Date G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
290	I	1903 June 5.681	− 19.4	.....	f	A, F	
290	I	1903 Oct. 24.536	− 8.6	.....	g	L, S	
290	I	1911 Aug. 8.641	− 10.7	+ 2.8	f	L, S	
291	I	1903 May 8.818	− 18.5	.....	p	L	
291	I	1903 May 16.808	− 15.3	.....	g	L	
291	I	1903 Sep. 18.681	− 19.2	− 8.3	vg	L	
291	I	1906 Sep. 14.596	− 22.6	− 25.4	vg	L	
291	I	1910 Aug. 19.596	− 23.0	− 36.3	vg	L	
292	I	1909 July 16.782	+ 12.4	.....	p	S	
292	I	1913 June 16.819	+ 43.1	.....	p	S	
292	I	1919 May 26.861	+ 4.2	.....	f	S	
292	I	1919 May 30.855	+ 20.0	.....	g	S	
293	I	1915 Aug. 30.608	+ 2.7	.....	vp	S	
293	I	1915 Sep. 17.588	+ 11.8	.....	vp	S	
293	I	1915 Oct. 1.578	− 32.3	.....	f	S	
293	I	1919 Aug. 18.608	− 40.5	− 7.0	g	S	
293	I	1919 Sep. 5.603	− 40.1	− 11.4	g	S	
293	I	1921 July 4.708	+ 18.9	.....	p	S	
293	I	1921 Sep. 5.587	− 57.2	.....	p	S	
293	I	1921 Sep. 9.588	+ 22.2	.....	p	S	
293	I	1921 Sep. 26.562	− 27.3	.....	f	S	
294	I	1903 May 8.862	− 25.7	.....	p	A	
294	I	1903 June 12.881	− 28.8	.....	g	A	
294	I	1903 June 13.849	− 25.1	.....	g	A, F	
295	I	1919 Sep. 19.563	+ 54.8	.....	vp	S	
295	I	1921 May 20.845	− 43.9	.....	f	S	
295	I	1921 Oct. 14.547	+ 59.4	.....	p	S	
295	I	1923 Aug. 19.596	+ 31.2	.....	g	S	−144.1, +206.6
296	I	1919 June 20.742	− 31.9	.....	p	S	
296	I	1920 May 28.782	− 25.6	− 24.4	g	S	
296	I	1920 July 23.676	− 15.0	− 15.8	f	S	
296	I	1924 Nov 2.515	− 22.0	− 29.1	g	S	
296	I	1924 Nov. 2.600	− 19.1	− 28.4	g	S	
296	I	1924 Nov. 3.512	− 17.4	− 16.4	g	S	
296	I	1924 Nov. 3.669	− 9.9	.....	f	S	
296	I	1924 Nov. 9.556	− 31.4	− 37.4	g	S	
297	I	1909 Aug. 6.726	− 5.2	.....	g	L	
297	I	1911 June 23.803	+ 7.8	.....	vg	L	
297	I	1911 Aug. 8.695	+ 0.1	.....	g	L	
297	I	1919 Apr. 25.924	− 19.2	.....	g	S	
298	I	1909 Sep. 10.585	− 28.8	.....	p	L	
298	I	1913 June 9.834	− 24.9	.....	g	L	
298	I	1913 June 27.798	− 57.4	.....	g	L	
298	I	1919 June 13.814	− 24.9	.....	f	S	
299	I	1909 Aug. 6.856	− 24.2	.....	g	L, S	
299	I	1909 Aug. 16.617	− 25.2	− 12.5	g	L, S	
299	I	1910 June 21.736	− 25.0	.....	f	L, S	
299	I	1910 June 24.727	− 26.4	− 43.1	g	L, S	
299	I	1911 June 19.785	− 9.1	.....	g	S	
299	I	1911 July 7.848	− 18.1	.....	f	S	
299	I	1911 Sep. 11.708	− 1.2	.....	p	S	
299	I	1912 July 26.840	− 19.6	− 23.2	g	S	
299	I	1912 Aug. 13.728	− 15.8	.....	f	S	
299	I	1913 June 13.884	− 5.1	− 28.4	g	S	
300	I	1914 Aug. 10.653	− 9.1	.....	p	S	

TABLE III—*Continued*

No.	Dis.	Date G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
300	I	1925 May 25.365	− 25.4	− 38.0	g	S	
300	I	1925 May 31.365	− 10.9	.....	f	S	
301	I	1925 June 1.309	− 13.6	.....	g	S	
301	I	1925 June 28.262	− 6.4	.....	g	S	
301	I	1925 July 2.250	− 5.0	.....	g	S	
302	I	1913 Aug. 4.601	+ 5.8	.....	f	W	
302	I	1918 May 13.893	+ 4.8	+ 39.8	g	W	
302	I	1919 Apr. 28.894	+ 2.5	.....	f	S	
303	I	1913 July 4.784	− 4.9	.....	f	W	
303	I	1913 Sep. 22.562	+ 5.7	+ 62.7	f	W	
303	I	1913 Oct. 13.534	+ 11.1	+ 54.7	f	W	
303	I	1914 July 2.765	+ 55.5	.....	vp	W	
304	I	1909 Aug. 6.788	+ 12.3	.....	f	S	
304	I	1909 Oct. 29.569	− 12.8	.....	f	S	
304	I	1920 Oct. 11.701	− 50.2	.....	g	S	
305	I	1903 June 13.807	− 14.2	.....	f	L, A	
305	I	1903 July 24.843	− 12.3	.....	vg	L	
305	I	1903 Sep. 5.640	− 14.0	.....	vg	L, A	
305	I	1903 Sep. 18.563	− 5.6	+ 0.9	vg	L, A	
305	I	1904 June 18.847	+ 21.1	.....	g	L	
306	I	1909 June 21.869	− 20.2	− 23.4	g	Mi	
306	I	1909 June 25.744	− 21.8	− 20.7	g	Mi	
306	I	1909 June 28.779	− 24.2	.....	p	L	
306	I	1909 July 5.708	− 23.1	− 29.4	g	Mi	
306	I	1910 July 4.779	− 15.0	− 17.8	g	L	
306	I	1912 Aug. 2.818	− 26.6	− 24.8	vg	L	
307	I	1915 June 8.865	+ 6.2	.....	p	S	
307	I	1915 June 21.831	− 5.7	.....	f	S	
307	I	1915 Sep. 20.600	− 7.0	.....	p	S	
308	I	1903 Oct. 23.606	− 37.8	.....	f	F, A	
308	I	1903 Oct. 24.576	− 28.6	.....	f	F, A	
308	I	1904 Mar. 19.892	− 30.5	.....	g	A	
308	I	1906 July 27.683	− 27.3	.....	f	S	
309	III	1902 July 11.747	− 19.5	.....	g	A	
309	III	1902 July 16.783	− 18.8	.....	g	A	
309	III	1902 July 23.833	− 25.4	.....	g	A	
309	III	1902 July 31.698	− 24.9	.....	g	A	
309	I	1903 Oct. 17.604	− 14.3	− 20.8	f	Ar	
309	I	1908 Aug. 7.782	− 16.7	.....	g	Ar	
310	I	1919 Sep. 12.588	− 16.9	− 24.0	g	S	
310	I	1919 Sep. 15.589	− 7.3	− 17.5	f	S	
310	I	1920 May 24.865	− 35.0	.....	f	S	
311	I	1909 Aug. 6.835	− 25.2	.....	f	S	
311	I	1918 May 22.874	− 3.1	.....	p	S	
311	I	1918 June 28.885	− 16.1	.....	p	S	
312	I	1904 June 11.883	+ 12.3	.....	g	L	
312	I	1911 July 3.803	− 3.9	− 18.5	vg	L	
312	I	1916 Aug. 21.617	− 8.1	.....	g	S	
312	I	1916 Aug. 27.690	− 1.9	.....	p	S	
313	I	1918 July 29.844	− 5.3	.....	f	S	
313	I	1920 May 28.873	− 10.1	− 19.7	g	S	
313	I	1924 Dec. 13.487	− 1.2	− 17.8	g	S	
314	I	1906 July 2.786	− 34.2	.....	f	S	
314	I	1906 July 13.783	− 22.8	.....	f	S	
314	I	1907 June 1.877	− 28.7	.....	g	S	

TABLE III—*Continued*

No.	Dis.	Date G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
314	I	1909 Aug. 16.666	− 13.0	.....	g	L	
314	I	1909 Sep. 13.571	− 14.7	.....	g	L	
314	I	1923 June 1.872	− 13.0	− 3.0	g	S	
315	I	1909 Aug. 20.664	− 21.7	.....	p	S	
315	I	1909 Sep. 10.732	− 16.4	.....	f	S	
315	I	1910 June 21.797	+ 12.3	.....	p	S	
315	I	1910 June 24.781	− 10.9	.....	f	S	
315	I	1910 July 29.708	− 6.0	.....	f	S	
315	I	1912 July 26.896	− 11.6	.....	f	S	
315	I	1912 Aug. 2.889	+ 1.1	.....	f	S	
315	I	1912 Aug. 30.638	− 10.4	− 12.6	g	S	
315	I	1912 Sep. 6.750	− 6.1	.....	g	S	
316	I	1925 June 28.331	+ 7.7	.....	g	S	
316	I	1925 July 5.324	+ 4.4	− 11.2	g	S	
316	I	1925 July 6.332	+ 7.1	− 12.0	g	S	
317	I	1903 May 16.881	−113.5	.....	g	F	
317	I	1903 May 17.797	− 22.3	.....	g	F	
317	I	1903 Oct. 23.653	− 17.5	.....	vg	L	−108.5, + 73.5
317	I	1906 July 23.764	− 5.0	.....	vg	L	− 83.2, + 73.1
318	I	1924 Nov. 12.610	− 16.3	.....	f	S	
318	I	1924 Dec. 1.566	− 14.8	− 22.1	f	S	
318	I	1924 Dec. 14.460	− 31.9	.....	g	S	
319	I	1919 June 27.790	− 25.4	.....	f	S	
319	I	1924 Dec. 22.506	− 30.8	+ 1.2	g	S	
319	I	1924 Dec. 24.494	− 26.0	.....	f	S	
320	I	1909 Aug. 27.797	− 4.0	.....	g	L, S	
320	I	1913 May 5.906	+ 24.0	.....	g	L, S	
320	I	1913 June 9.888	+ 6.6	.....	p	L, S	
321	I	1919 May 12.589	+ 1.1	.....	g	S	
321	I	1919 Sep. 1.602	+ 17.5	+ 16.3	f	S	
321	I	1920 June 7.838	− 8.1	.....	g	S	
322	I	1904 Apr. 15.906	− 14.8	− 2.7	vg	Ar	
322	I	1904 Nov. 25.494	− 20.1	.....	vp	Ar	
322	I	1905 Apr. 7.931	− 14.7	.....	vp	Ar	
322	I	1918 July 1.777	− 10.0	.....	f	S	
323	I	1903 July 4.833	− 8.7	.....	g	S	
323	I	1903 July 31.815	− 25.5	.....	g	S	Br. +17.0
323	I	1904 May 21.819	− 11.1	.....	g	S	Br. +23.0
323	I	1906 July 27.751	− 1.2	.....	g	S	Br. + 3.8
323	I	1916 Oct. 30.506	− 24.0	.....	f	S	Br. −20.5
324	I	1903 Oct. 23.699	+ 25.6	− 13.1	g	S	
324	I	1904 June 17.789	+ 41.7	.....	f	S	
324	I	1919 June 30.775	− 28.5	− 18.3	f	S	
325	I	1905 May 8.854	− 14.9	.....	p	S	
325	I	1924 Aug. 9.662	− 25.0	.....	g	S	Br. − 9.2
325	I	1924 Aug. 11.680	− 41.1	.....	g	S	Br. + 2.0
326	I	1903 July 31.861	− 14.5	.....	p	F, L	
326	I	1903 Oct. 17.725	− 0.4	.....	vg	L	
326	I	1904 June 17.718	− 47.8	.....	g	L	
326	I	1904 July 15.869	− 31.5	.....	p	S	
327	I	1918 Sep. 13.741	+ 16.6	+ 34.6	g	S	
327	I	1918 Sep. 30.674	+ 17.8	.....	g	S	
327	I	1924 Dec. 13.581	+ 3.5	− 23.9	g	S	
328	II	1906 July 6.644	− 16.6	.....	g	F	
328	II	1906 July 6.666	− 24.9	.....	g	F	

TABLE III—*Continued*

No.	Dis.	Date	G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
328	II	1906 July	6.687	− 26.2	.....	g	F	
328	II	1906 July	6.727	− 8.3	.....	f	F	
328	II	1906 July	6.747	+ 3.4	.....	f	F	
328	II	1906 July	6.767	+ 7.3	.....	g	F	
328	II	1906 July	6.786	+ 8.8	.....	g	F	
328	II	1906 July	6.807	− 4.1	.....	g	F	
328	II	1906 July	6.826	− 8.9	.....	g	F	
328	II	1906 July	6.845	− 19.0	.....	g	F	
328	II	1906 July	6.865	− 22.0	.....	f	F	
328	II	1906 July	6.889	− 19.9	.....	f	F	
329	I	1915 Sep.	17.668	− 22.1	.....	f	S	
330	I	1909 Aug.	6.894	− 19.2	− 0.7	vg	L, S	
330	I	1909 Aug.	16.715	− 16.5	.....	p	L	
330	I	1909 Sep.	10.657	− 17.2	.....	p	L	
330	I	1909 Oct.	25.633	− 9.0	+ 10.8	g	L, W	
331	I	1906 Sep.	24.676	− 24.1	.....	p	S	
332	I	1903 July	11.750	− 8.1	.....	g	A, F	
332	I	1903 Aug.	8.710	− 7.4	.....	f	A	
332	I	1903 Sep.	18.601	− 7.7	.....	g	A	
332	I	1906 Sep.	10.707	− 17.6	.....	g	L	
332	I	1911 Aug.	18.684	− 25.1	− 25.6	vg	L	
332	I	1911 Aug.	28.658	− 31.2	− 38.2	g	L, S	
333	III	1903 Apr.	16.912	− 19.6	.....	g	A	
333	III	1903 May	6.861	− 19.6	.....	g	A	
333	I	1903 July	11.710	− 21.6	.....	g	F, A	
333	I	1906 Sep.	10.758	− 15.4	.....	g	S	
333	I	1917 Oct.	1.527	− 12.6	− 25.2	g	S	
334	I	1903 July	4.879	− 14.4	.....	vp	L	
334	I	1904 Nov.	1.580	− 4.0	.....	g	L	
334	I	1904 Nov.	15.558	− 31.7	.....	g	L	
334	I	1905 Aug.	28.775	+ 0.6	.....	g	L	
334	I	1918 Aug.	26.667	+ 14.9	.....	f	S	
334	I	1919 June	11.872	− 3.6	.....	f	S	
334	I	1919 Sep.	22.581	+ 8.2	+ 11.7	g	S	
334	I	1919 Oct.	3.573	− 0.8	.....	g	S	
335	I	1913 Aug.	1.752	+ 80.2	.....	f	S	
335	I	1924 Dec.	9.628	+ 1.1	+ 5.0	g	S	
335	I	1924 Dec.	22.594	− 4.6	.....	p	S	
336	I	1921 Mar.	28.911	− 25.1	.....	p	Bk	
336	I	1921 Apr.	18.862	− 24.3	.....	f	Bk	
336	I	1921 May	6.844	− 13.2	.....	f	Bk	
336	I	1921 Aug.	8.713	+ 41.0	.....	f	Bk	
336	I	1922 Mar.	31.900	− 18.1	.....	g	S	
336	I	1922 Apr.	7.884	− 16.7	.....	g	S	
336	I	1922 Apr.	17.885	− 25.5	.....	g	S	
336	I	1922 Apr.	21.849	− 21.0	− 12.7	vg	S	
336	I	1922 June	12.808	− 21.9	.....	g	S	
336	I	1922 June	16.697	− 15.0	.....	f	S	
336	I	1922 June	16.840	− 6.5	.....	g	S	
336	I	1922 June	23.808	− 1.5	.....	f	S	
336	I	1922 July	3.719	− 11.7	.....	f	S	
336	I	1922 July	10.688	− 16.9	.....	p	S	
337	I	1908 Oct.	9.517	+ 12.6	.....	g	L	
337	I	1910 July	8.863	+ 8.0	.....	vg	L	
337	I	1910 Aug.	23.652	− 3.2	.....	p	S	

TABLE III—*Continued*

No.	Dis.	Date	G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
337	I	1910 Sep.	19.583	+ 8.3	.....	vg	L, S	
338	I	1908 Sep.	25.608	− 10.5	.....	g	L	− 67.5, + 46.5
338	I	1908 Sep.	29.616	− 60.0	.....	g	L	−129.5, + 9.5
338	I	1908 Oct.	2.691	− 19.0	.....	f	L	− 86.5, + 48.5
338	I	1908 Oct.	9.549	+ 0.5	.....	g	L	− 96.5, + 97.5
338	I	1908 Oct.	12.519	+ 19.0	.....	g	L	− 65.5, +103.5
339	I	1913 June	27.869	− 15.0	.....	g	L, S	
339	I	1913 July	9.853	+ 7.6	.....	p	L, S	
339	I	1913 Sep.	1.808	− 19.1	.....	p	L, S	
339	I	1920 June	25.844	− 43.0	.....	f	S	
339	I	1920 July	23.801	− 30.9	.....	f	S	
339	I	1923 Aug.	19.729	+ 7.2	+ 12.5	g	S	
340	I	1917 Sep.	17.619	+ 7.8	.....	f	S	
340	I	1917 Sep.	24.638	+ 5.4	.....	p	S	
340	I	1918 Oct.	18.652	− 0.4	.....	g	S	
341	I	1904 Oct.	28.606	− 51.1	.....	g	L	
341	I	1904 Nov.	1.683	− 93.5	.....	g	L	
341	I	1908 Aug.	24.733	− 62.3	.....	g	L	
341	I	1918 Sep.	13.625	− 74.4	− 12.1	f	S, W	
342	I	1909 Aug.	20.812	− 33.9	.....	vg	L, S	
342	I	1913 Sep.	22.651	− 2.8	.....	vg	L, S	
342	I	1913 Oct.	3.597	− 8.0	.....	p	L	
343	I	1913 Oct.	18.590	− 10.7	− 17.6	g	S	
343	I	1913 Oct.	31.517	− 4.6	− 0.4	f	S	
343	I	1919 Sep.	19.669	− 8.2	.....	p	S	
344	I	1908 Oct.	16.691	− 4.9	.....	p	S	
344	I	1910 Sep.	30.606	+ 14.8	.....	g	S	
344	I	1910 Oct.	14.626	+ 24.6	.....	p	S	
344	I	1918 Aug.	26.754	+ 16.3	.....	f	S	
344	I	1918 Sep.	16.743	+ 3.3	.....	g	S	
345	I	1908 Oct.	16.633	+ 18.8	.....	g	L	
345	I	1908 Nov.	2.608	+ 7.7	.....	vg	L, S	
345	I	1910 Oct.	11.562	+ 7.0	− 2.3	vg	L, S	
345	I	1919 Oct.	29.638	+ 8.5	.....	g	S	
346	I	1903 Aug.	8.747	− 91.0	.....	f	F, A	
346	I	1903 Sep.	5.738	− 15.8	.....	g	F, A	
346	I	1903 Sep.	25.560	+ 1.3	.....	f	F, A	
346	I	1905 Sep.	25.571	− 1.7	.....	f	S	
347	I	1915 July	9.875	+ 23.3	.....	g	S	
347	I	1915 July	16.806	+ 32.0	.....	p	S	
347	I	1915 July	30.853	− 10.3	.....	p	S	
347	I	1915 Aug.	6.752	+ 8.9	.....	f	S	
347	I	1919 Oct.	3.657	− 7.5	− 28.3	g	S	
347	I	1919 Oct.	17.532	− 2.1	− 8.7	g	S	
347	I	1919 Oct.	31.646	+ 7.5	.....	f	S	
347	I	1919 Nov.	14.478	+ 2.4	− 11.3	g	S	
347	I	1919 Nov.	14.521	− 12.2	− 12.6	g	S	
347	I	1919 Nov.	17.518	− 14.5	− 27.0	g	S	
348	I	1903 May	7.800	− 24.1	.....	g	A	
348	I	1903 Sep.	5.699	− 23.3	.....	vg	A	
348	I	1903 Sep.	18.719	− 20.5	.....	g	A	
348	I	1909 Sep.	13.625	− 17.3	.....	p	S	
348	I	1910 July	4.864	− 35.5	.....	f	S	
348	I	1910 July	25.771	− 29.9	.....	g	S	
349	I	1903 June	26.823	− 25.2	.....	f	F, A, L	

TABLE III—*Continued*

No.	Dis.	Date	G.M.T	V	V_{Ca}	Qual.	Meas.	Remarks
349	I	1903 Aug.	8.783	− 12.2	− 18.1	f	F, A, L	
349	I	1903 Sep.	18.754	− 3.1	− 4.4	f	F, A, L	
349	I	1905 Sep.	29.610	− 11.5	.....	g	L	
349	I	1907 Sep.	24.726	− 22.0	− 9.9	vg	L	
349	I	1911 June	29.882	− 9.0	+ 3.4	vg	L	
349	I	1911 July	3.867	− 8.2	− 15.6	vg	L	
350	I	1906 July	23.899	− 7.0	.....	g	S	
350	I	1908 Aug.	7.851	+ 11.1	.....	g	S	
350	I	1908 Nov.	9.581	+ 9.5	.....	g	S	
350	I	1910 June	24.888	− 0.9	.....	f	S	
351	I	1908 Oct.	2.762	− 5.5	.....	f	S	
351	I	1908 Oct.	9.603	+ 48.1	.....	f	S	
351	I	1924 Nov.	19.631	+ 48.4	− 50.0	g	S	
352	I	1903 Sep.	25.614	− 9.2	− 5.1	g	F, A, Lo	
352	I	1903 Oct.	17.774	− 4.6	.....	g	F, A, Lo	
352	I	1903 Oct.	24.618	− 9.6	.....	vg	F, A, Lo	
352	I	1904 Nov.	1.635	− 14.2	.....	vg	F, Lo	
352	I	1904 Nov.	11.605	− 7.6	.....	g	F, Lo	
352	I	1904 Nov.	15.609	− 4.1	.....	g	F, Lo	
352	I	1904 Nov.	18.607	− 9.6	− 16.0	vg	F, Lo	
352	I	1905 July	14.797	− 3.4	.....	f	F, Lo	
352	I	1906 Sep.	17.656	− 18.2	.....	g	F, Lo	
352	I	1907 June	10.865	− 19.8	.....	vg	F, Lo	
352	I	1907 July	26.818	− 17.5	.....	vg	F, Lo	
352	I	1907 Nov.	22.598	− 8.3	− 6.9	vg	F, Lo	
352	I	1908 July	31.867	− 17.9	.....	vg	F, Lo	
352	I	1909 Oct.	29.632	− 19.1	.....	g	F, Lo	
352	I	1913 July	4.861	+ 2.4	.....	p	F	
352	I	1913 Aug.	29.840	− 2.9	.....	p	F, Lo	
352	I	1913 Sep.	4.803	− 10.8	.....	g	F, Lo	
352	I	1913 Sep.	5.658	− 7.8	.....	g	F, Lo	
352	I	1913 Sep.	8.765	− 10.5	.....	p	F, Lo	
352	I	1913 Sep.	10.830	− 11.8	.....	g	F, Lo	
353	I	1903 June	13.881	+ 0.9	.....	f	L	
353	I	1908 Aug.	28.722	+ 9.5	.....	g	S, L	
353	I	1908 Sep.	7.647	+ 3.1	.....	vg	L	
353	I	1908 Sep.	8.590	+ 19.9	.....	vg	L	
353	I	1909 Nov.	19.569	− 0.6	.....	g	L	
353	I	1916 Aug.	18.752	+ 14.6	.....	f	S	
353	I	1916 Sep.	4.745	+ 24.5	.....	f	S	
354	I	1908 Oct.	2.631	+ 17.4	.....	g	Ar	
354	I	1910 Oct.	28.529	− 9.2	− 24.7	p	Ar	
354	I	1911 Aug.	7.766	− 31.3	− 3.6	vg	Ar	
355	I	1909 Aug.	23.709	− 39.8	− 20.6	f	S, L	
355	I	1909 Nov.	8.696	+ 7.3	− 19.2	f	S, L	
355	I	1909 Nov.	22.597	+ 5.0	.....	p	S, L	
355	I	1924 Sep.	22.633	+ 21.1	− 33.5	g	S	
355	I	1924 Sep.	24.794	− 4.8	.....	f	S	
355	I	1924 Sep.	26.568	− 21.9	.....	g	S	
355	I	1924 Sep.	28.551	− 16.7	.....	f	S	
355	I	1924 Sep.	28.787	− 24.5	.....	g	S	
355	I	1924 Sep.	28.866	− 32.8	.....	g	S	
355	I	1924 Sep.	29.660	− 19.1	.....	p	S	
355	I	1924 Sep.	29.808	− 20.1	− 53.1	f	S	
355	I	1924 Oct.	1.550	− 10.2	.....	g	S	

TABLE III—*Continued*

No.	Dis.	Date	G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
355	I	1924 Oct.	1.725	− 3.4	.....	f	S	
355	I	1924 Oct.	1.823	+ 0.6	.....	f	S	
355	I	1924 Oct.	4.558	+ 23.0	.....	g	S	
355	I	1924 Oct.	5.557	+ 8.9	.....	f	S	
355	I	1924 Oct.	5.765	+ 5.1	.....	g	S	
355	I	1924 Oct.	7.715	− 6.6	.....	f	S	
355	I	1924 Oct.	8.729	− 17.0	.....	g	S	
355	I	1924 Oct.	16.583	+ 16.7	− 5.3	g	S	
355	I	1924 Oct.	16.737	+ 7.0	.....	f	S, Bf	
355	I	1924 Oct.	19.547	− 0.8	.....	f	S	
355	I	1924 Oct.	22.578	− 33.1	− 24.1	vg	S	
355	I	1924 Oct.	25.540	− 21.1	− 19.0	g	S	
355	I	1924 Oct.	26.542	− 5.1	− 18.9	g	S	
355	I	1924 Oct.	29.551	+ 18.5	.....	f	S	
355	I	1924 Dec.	27.493	− 3.2	.....	f	S	
355	I	1925 Jan.	5.984	− 24.5	− 19.2	g	S	
355	I	1925 Jan.	8.018	− 9.0	− 17.1	g	S	
355	I	1925 Jan.	10.993	+ 9.2	− 15.6	g	S	
355	I	1925 Jan.	15.005	− 14.7	.....	f	S	
356	I	1913 July	28.786	− 11.0	.....	g	F	
356	I	1913 Aug.	4.728	− 15.1	.....	vg	F	
356	I	1913 Oct.	9.665	− 13.4	.....	g	S	
356	I	1918 Aug.	5.765	+ 6.7	.....	p	S	
356	I	1918 Aug.	30.899	+ 8.2	.....	p	S	
357	III	1902 Aug.	11.610	− 18.7	.....	g	S	
357	III	1902 Sep.	6.708	− 14.2	.....	g	S	
357	I	1905 July	14.837	− 28.5	.....	g	L	
357	I	1905 Aug.	21.640	− 16.3	.....	vp	L	
357	I	1908 Sep.	18.638	− 5.2	.....	vg	L	
358	I	1903 Aug.	8.876	− 4.0	.....	p	A	
358	I	1903 Sep.	25.657	− 7.8	.....	g	A	
358	I	1903 Oct.	17.682	− 4.7	.....	g	A	
358	I	1903 Oct.	23.744	+ 13.7	.....	g	S	Br. +10.6
358	I	1903 Nov.	7.573	+ 3.6	.....	g	F, A	
358	I	1903 Dec.	1.485	+ 5.0	.....	g	A, F	Br. + 0.8
358	I	1904 Nov.	15.493	+ 2.8	.....	f	Ar	Br. + 2.6
358	I	1905 Sep.	18.676	− 1.7	.....	p	Ar	Br. − 7.9
358	I	1906 Sep.	14.838	+ 7.5	.....	vp	Ar	Br. − 6.7
358	I	1907 Nov.	22.490	− 1.9	.....	vp	Ar	Br. + 6.3
358	I	1908 Nov.	2.553	+ 8.0	.....	vp	Ar	Br. +10.3
358	I	1917 Oct.	3.685	+ 2.0	.....	p	S	
358	I	1917 Oct.	8.222	− 13.4	.....	f	S	Br. +10.6
358	I	1917 Oct.	15.598	− 34.4	.....	f	S	Br. +12.4
359	I	1903 Sep.	18.640	− 11.4	.....	g	A	
359	I	1903 Oct.	10.553	− 3.8	.....	g	F, S	
359	I	1903 Oct.	17.853	− 10.4	.....	g	A	
359	I	1910 July	19.786	− 8.4	− 3.2	g	F	
359	I	1910 Oct.	11.620	− 12.8	.....	f	F, S	
359	I	1910 Oct.	31.565	− 4.1	.....	f	S	
360	I	1913 July	14.884	+ 11.6	.....	vp	S	
360	I	1917 Aug.	31.711	+ 33.2	.....	f	S	
360	I	1923 Aug.	19.807	+ 46.4	.....	f	S	
361	I	1908 Sep.	21.715	+ 24.0	.....	f	S	
361	I	1908 Nov.	16.547	− 27.4	.....	g	S	
361	I	1916 Nov.	16.572	+ 16.6	.....	f	S	

TABLE III—*Continued*

No.	Dis.	Date G.M.T.	V	V_{Ca}	Qual.	Meas.	Remarks
361	I	1916 Dec. 13.522	− 3.7	.....	p	S	
361	I	1917 Jan. 5.982	− 26.8	.....	g	S	
361	I	1918 Aug. 18.794	− 17.3	.....	g	S	
361	I	1918 Sep. 16.821	− 8.2	.....	g	S	
361	I	1918 Sep. 28.667	− 21.3	.....	g	S	
362	I	1913 Oct. 13.610	+ 19.6	.....	g	S	
362	I	1913 Oct. 23.594	+ 30.0	.....	g	S	
362	I	1913 Nov. 10.521	+ 3.4	.....	f	S	
362	I	1914 Sep. 8.680	+ 0.4	.....	g	S	
362	I	1916 Oct. 7.602	+ 4.4	.....	g	S	
363	I	1903 Oct. 24.658	− 64.7	.....	g	F, A	
363	I	1903 Oct. 30.880	− 60.2	.....	p	A	
363	I	1903 Oct. 31.644	− 60.4	.....	f	F, A	
363	I	1903 Nov. 7.703	− 1.6	.....	g	F, A	
364	I	1906 Sep. 21.769	+ 8.9	.....	g	S	
364	I	1906 Oct. 22.617	+ 2.6	.....	g	S	
364	I	1908 Aug. 7.895	− 4.3	.....	g	Ca	
364	I	1908 Aug. 17.753	+ 2.4	.....	vg	Ca	
364	I	1908 Aug. 21.738	− 1.8	.....	g	Ca	
364	I	1908 Aug. 25.736	− 4.2	.....	f	Ca	
364	I	1908 Sep. 18.701	− 4.7	.....	g	S	
364	I	1908 Nov. 10.686	+ 7.7	.....	g	S	
364	I	1908 Dec. 7.476	− 9.8	.....	f	S	
364	I	1908 Dec. 21.476	− 10.1	.....	g	Ca	
364	I	1909 Aug. 16.875	+ 13.0	.....	g	Ca	
364	I	1911 July 24.883	+ 2.1	+ 2.6	vg	Ca	
364	I	1914 July 21.872	+ 2.0	.....	p	S	
364	I	1914 Aug. 4.761	− 3.4	.....	f	Ca	
365	I	1912 Sep. 2.689	+ 17.1	.....	p	S	
365	I	1912 Nov. 22.620	+ 7.0	.....	f	S	
365	I	1919 Sep. 5.722	+ 27.8	.....	f	S	
365	I	1920 Oct. 11.550	− 15.7	.....	f	S	
366	I	1917 July 30.842	+ 19.2	.....	vp	S	
366	I	1917 Aug. 3.835	+ 19.0	.....	g	S	
366	I	1919 Aug. 18.908	+ 43.0	.....	g	S	
367	I	1903 Oct. 24.696	− 16.2	.....	g	S, A	
367	I	1903 Oct. 31.690	− 0.5	.....	g	A	
367	I	1903 Nov. 7.752	− 5.8	.....	f	A	
367	I	1906 Sep. 17.726	− 6.8	.....	p	L	
367	I	1907 Nov. 23.526	− 7.9	.....	p	S, L	
368	I	1911 Aug. 7.899	+ 19.4	.....	g	L, S	
368	I	1912 Dec. 10.544	+ 14.0	− 2.5	vg	L, S	
368	I	1913 Sep. 8.845	+ 20.3	.....	p	S	
368	I	1918 Sep. 30.769	+ 20.5	.....	f	S	

DETERMINATION OF THE SOLAR MOTION

A preliminary solution for the solar motion was derived in a previous paper by Kapteyn and Frost[1] for 61 of the brighter stars of class B. Almost all of these stars are included in our present paper, but the average number of spectrograms per star was then small.

[1] *Astrophysical Journal*, **32**, 83, 1910.

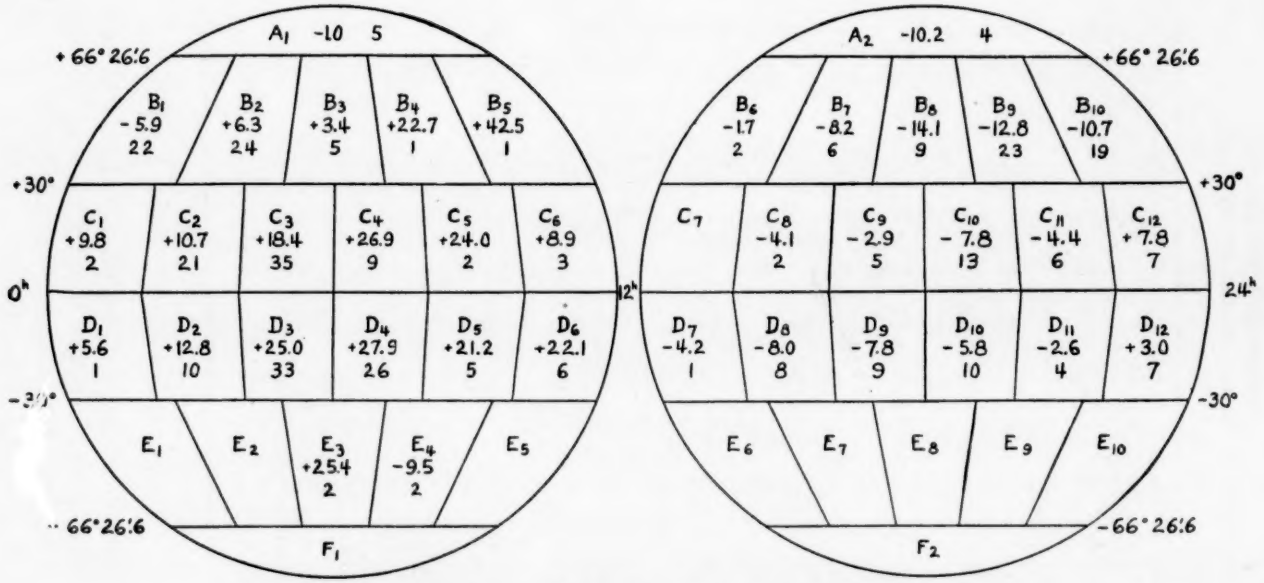

FIG. 2.—Distribution and average radial velocities for 350 B stars in Charlier's areas

In this early solution the solar apex was assumed to be at $\alpha = 269^\circ.7$, $\delta = +30^\circ.8$ for 1875.0. The velocity of the sun was found to be 23.3 km/sec., while the average residual velocity was 6.3 km/sec. The K-term, indicated by the difference of the sun's velocity from stars near the apex and antapex, was 5.0 km/sec.

We have now made a new solution both for the position of the apex and for the velocity of the sun, based on the velocities of Table II. Unfortunately this is affected by the somewhat unbalanced distribution of the stars employed, inasmuch as only very few stars south of -30° could be observed here.

Eighteen stars, placed in parentheses in Table II, whose current numbers follow, were omitted from the solution: 25, 40, 86, 108, 126, 129, 178, 226, 231, 241, 249, 276, 295, 328, 329, 331, 351, 354. For stars 53 and 195, provisional values of +13.0 and +35.7 km/sec. respectively, were used in the solution. The definitive values derived from the orbits, which were subsequently determined, are +15.0 and +80.0 km/sec.

The sky was divided according to the scheme of C. V. L. Charlier,[1] into 48 equal areas, of which 37 could be used for our least-squares solution. Equal weights were assigned to each area so that the large number of B stars in the region of Orion and Monoceros should not have too predominant an influence. This solution yielded the following results: the right ascension of the apex is $283^\circ.8$, the declination is $+11^\circ.7$; the velocity of the solar motion is 17.2 km/sec. The average residual velocity is 10.0 km/sec. This includes the accidental errors of observation indicated by the average probable error of ± 3.5 km/sec., and the radial component of the random velocities of the stars, which amounts to 9.4 km/sec. This is larger than the value of 7.0 km/sec., found by Frost and Adams for the first 20 bright stars, of which the average magnitude was 3.0, and that of 6.3 km/sec., found by Kapteyn and Frost for 61 stars of average magnitude 3.7. The average magnitude of the 350 stars used in this solution is 4.7. This seems to indicate that the average residual velocity increases as we use fainter stars. By grouping our 350 stars according to magnitude we find the following distribution of average residual velocities:

[1] *Meddelanden från Lunds Astronomiska Observatorium*, Serie II, 1, No. 9, p. 24, 1912.

DISTRIBUTION OF AVERAGE RESIDUAL VELOCITIES

Magnitude	Number of Stars	Residual Velocity		
		K=+5.6 km/sec.	K Adjusted for Each Group	Solar Motion Assumed
0.0–1.9	7	6.7	6.2	4.6
2.0–2.9	18	12.0	10.5	10.9
3.0–3.9	34	10.2	9.9	11.7
4.0–4.5	55	9.3	9.2	9.0
4.6–5.0	92	9.1	8.9	9.4
5.1–5.3	67	12.1	11.9	12.6
5.4–5.5	63	9.7	9.7	12.3
5.6–6.5	14	17.6	13.7	14.0

The last column was obtained by assuming the solar motion to be at $\alpha = 270°.0$, $\delta = 30°.0$; $V = 20.0$ km/sec. The progression of residual velocity with magnitude is not uniform, and additional material for fainter stars is required to establish its reality.

Figure 2 gives the average velocities and the number of stars for each area. The apex and antapex of the solar motion would fall near the centers of the areas C10 and D4 respectively.

It will be noticed that the declination of the apex from our solution is lower than that usually found. This is in part due to the absence of observations of stars south of about $-35°$ and in part to the effect of a few abnormal regions, such as areas B5 and E4 in Figure 2. The large positive velocity of the first is due to the star 42 Leonis Minoris, a spectroscopic binary with a range of some 60 km/sec.

It is still impossible to offer any adequate explanation of the K-term, amounting to +5.6 km/sec. It would be explained, if we could adopt the idea that the group of helium stars is expanding outward with that velocity. If the wave-lengths of the lines in these stars were in the blue and violet part of the spectrum about 0.08 A longer than in the laboratory, this excess of positive velocity or recession could be accounted for. The Einstein displacement due to the gravitational field of these comparatively massive stars may reasonably account for a part of this, and the downward convection in the stellar atmospheres may be the cause of another part of the K-effect.

The difference between our value of +5.6 km/sec. and that of +4.1 km/sec. found by Campbell for 225 B stars, must be due to the systematic difference between the Yerkes and Lick velocities referred to above. The revival by the International Astronomical Union of the plan for the observation by different observatories of a list of standard velocity stars will ultimately lead to the accurate determination of the systematic errors of each observatory and will tend to remove this discrepancy.

YERKES OBSERVATORY
May 17, 1926

REVIEWS

Hutchinson's Splendour of the Heavens: A Popular Authoritative Astronomy, edited by T. E. R. PHILLIPS and W. H. STEAVENSON. London: Hutchinson & Co., 1923. 2 vols. Pp. 980. 25 colored plates; figs. 1,104. Price, $12.50.

To present, in a form attractive to the general public, the elements of a science in an accurate and simple manner is a high achievement; to make them interesting and valuable also to the specialist in that science is a rare one. *Hutchinson's Splendour of the Heavens*, by the collaboration of eighteen well-known professional and amateur English astronomers, does these two things with undoubted success.

The twenty-four chapters cover the usual range of astronomy, but add interesting bits of astronomical history, the determination of time, the calendar, nautical astronomy, numerous lists and charts for observers, a glossary, and a valuable chronometric chart of the development of astronomy and astrophysics.

The illustrations and colored plates are excellent. They are, however, often on too large a scale, and, in some chapters, too numerous. It seems hardly worth while to present as many as ninety-three drawings and photographs of the disk of Mars in addition to twenty-four drawings of details and six large charts. And there are thirty-three reproductions of Halley's comet. Such profusion, together with the great size of some of the illustrations, necessarily limits the text. Future editions should add to the description under each illustration the number of the page on which it is further described.

Less frequently than one expects in an entirely new work, a careless phrase or an error creeps in. Some examples may be given. On page 277 the western limb of the moon is allowed to overtake Aldebaran—the plate should be reversed; on page 68, at first reading, trailing of the image with an objective-prism is said to prevent narrow lines; on page 166 and elsewhere credit for photographs is given to the wrong observatory; on pages 974 and 975 Hale and Pease, instead of Michelson and Pease, are credited with the first application of the interferometer to the measurement of the diameters of the stars; on page 73 astronomy is replaced by theology in explaining why the sun outweighs the combined masses of the

planets. It is to be regretted that the term "falling stars" is preferred to "meteors." It should be banished from an astronomer's vocabulary, for the vast majority of the public think that they are actually stars.

But when the reviewer has mentioned a few errors, and has added that the index is quite too meager and should be thoroughly revised and enlarged, the impression remains that here is a most welcome and a most valuable addition to the library of every astronomer and of every friend of the science.

STORRS B. BARRETT

Climatic Changes: Their Nature and Causes. By ELLSWORTH HUNTINGTON and STEPHEN S. VISHER. New Haven: Yale University Press, 1922. Pp. xiii+329. Maps, diagrams, and charts. Price, $3.50.[1]

Earth and Sun: An Hypothesis of Weather and Sun-Spots. By ELLSWORTH HUNTINGTON, with a chapter by H. HELM CLAYTON. New Haven: Yale University Press, 1923. Pp. xxv+296. Diagrams. Price, $5.00.[1]

There is both an advantage and a disadvantage to the reviewer of books which have been published for some time. He knows the opinions of others and cannot be wholly free from reactions therefrom.

These books make a bold attempt to gather together facts from many sciences, to accept and discard theories, to criticize results, and to unite all in a general far-reaching hypothesis. Such an attempt, however valuable it may be, cannot be entirely satisfactory; it is certain to be open to criticisms and can, at best, prove but a point of departure for future work. To do it at all satisfactorily would require the continued collaboration of a physicist, an astronomer, a meteorologist, a geographer, a chemist, a geologist, and a botanist, with perhaps aid from a still wider range of the sciences. The faults which have been pointed out in previous reviews of these books seem to be due mainly to the fact that there was not a sufficient number of authors.

One of the best and most interesting features of both books is the summarizing of observed facts regarding the uniformity and the changes

[1] This review of these two books does not reflect the very unfavorable opinion of them held in the editorial office of this *Journal*. When indulging in extravagant speculations in the first volume, the authors frequently ask for a deferred judgment on the part of the reader until the second volume should appear. We fear that in this way some of the most unscientific features escape the severity of criticism which they may deserve.—EDITORS

of geological and historical climate, especially the story of the fourteenth century and of the relationships of disturbances on the sun to those on the earth. There are few astronomers or meteorologists who would not profit well by reading these chapters. However, there seems to the reviewer to be a carelessness in drawing conclusions and a lack of proper appreciation of the steps necessary in a logical discussion of cause and effect. One example may perhaps be given. The extreme climate of the fourteenth century is discussed and considered as due probably to great solar activity. All the most striking features come during the early half of the century. The authors summarize: "The New World as well as the Old appears to have been in a state of climatic stress during the first half of the fourteenth century." The numerous examples leave little doubt about the unusualness of that century. Yet when we examine Fritz's record of sun-spots we find that none were observed in Europe between 1276 and 1370, one of the three longest intervals of dearth after the second century!

A great part of the second volume is devoted to an electrical hypothesis of the origin of sun-spots. This has been especially studied by the reviewer, who attempts to read every such hypothesis. Here, as in every other hypothesis that has been propounded to date, he feels that the favorable evidence is negligible compared to the great mass of observation which it is necessary to explain. On the other hand, these chapters are interesting and are well worth perusal by students of solar phenomena.

The reviewer feels that the study of these volumes has been worth the time required. They are interestingly written, stimulating, full of imagination, and contain much that will cause thought to the student who reads them carefully. It is unfortunate that certain errors have crept in; these make the reader wonder how accurate are those statements which he cannot judge for himself. But nevertheless the books strike a new note in the subject, and when all is balanced the advice to those interested in climate and in the sun is, read them.

DINSMORE ALTER